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Current Affairs (CONSOLIDATION)

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Polity and Governance

Highlights

- PM-WANI
- SASCI Development of Iconic Tourist Centres to Global Scale
- Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024
- Assessing Universal Basic Literacy in India
- India's Cooperative Movement
- ICA Global Cooperative Conference 2024
- SC Upholds EVM and VVPAT System
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- Comptroller and Auditor General of India
- Conduct Rules for Civil Servants
- State Finance Commission
- Reforming Khap Panchayat

PM-WANI

Why in News?

The **Prime Minister's Wi-Fi Access Network Interface (PM-WANI)** framework aims to enhance internet accessibility across India by setting up public Wi-Fi hotspots.

- With 246,993 hotspots installed as of November 2024, the initiative is a key part of **India's Digital India mission**, aiming to provide affordable and widespread internet access.

What is PM-WANI?

- **About:** Launched in 2020 by the **Department of Telecom (DoT)**, the PM-WANI framework aims to expand public Wi-Fi hotspots across India, particularly in rural areas.
 - It allows local businesses, like shopkeepers, to set up Wi-Fi hotspots, providing affordable internet access and supporting the goals of the **National Digital Communications Policy, 2018**.
- **Importance:** By enabling **local businesses** to become Wi-Fi providers without requiring licenses or fees, the scheme promotes ease of doing business and ensures rapid deployment.
 - PM-WANI will significantly **improve internet access** fostering **digital inclusion and innovation**.

➤ PM-WANI Ecosystem:

- **Public Data Office (PDO):** Establishes, maintains, and operates PM-WANI compliant Wi-Fi hotspots.
 - PDOs provide last-mile connectivity by procuring internet bandwidth from telecom or internet service providers and delivers broadband services to subscribers.
- **Public Data Office Aggregator (PDOA):** Provides aggregation services such as authorization and accounting to PDOs.
 - PDOA facilitates PDOs in delivering services to end consumers.
- **App Provider:** Develops an application to register users and display PM-WANI compliant Wi-Fi hotspots nearby. Authenticates potential broadband users for accessing the internet service.
- **Central Registry:** It maintains the details of App Providers, PDOAs, and PDOs. It is currently managed by the **Centre for Development of Telematics (C-DoT)**.
 - C-DoT was established in 1984. It is an autonomous Telecom R&D (Research and Development) centre of **DoT (Department of Telecom), Ministry of Communications**. It is a registered society under the **Societies Registration Act, 1860**.

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National Digital Communications Policy, 2018

- **About:** NDCP, 2018 aims to transform India into a digitally empowered economy by enhancing digital infrastructure and services.
 - **NDCP 2018 set a goal to deploy 10 million public Wi-Fi hotspots by 2022.**
- **Key Objectives:** Ensuring universal broadband access, creating four million jobs, increasing the Digital Communications sector's **Gross Domestic Product (GDP)** contribution to 8%, and ensuring digital sovereignty.
- **Key features:** It involves providing broadband at **50 Mbps for all citizens**, ensuring connectivity in uncovered areas, **attracting USD 100 billion in investments**, training one million individuals in **New Age Skills**.
 - NDCP 2018 also focuses on expanding the **Internet of Things** ecosystem, establishing data protection, and ensuring accountability and security in digital communications.
- **NDCP, 2018 and Wi-Fi hotspots Target:** India has missed its public Wi-Fi rollout target, achieving **just 0.5 million hotspots** instead of the 10 million goal set by the NDCP, 2018.

Note: The **Bharat 6G Vision** targets 50 million public Wi-Fi hotspots by 2030, requiring significant growth and reduced connectivity costs to achieve this goal.

SASCI Development of Iconic Tourist Centres to Global Scale

Why in News?

The Union Government has allocated Rs 3,295 crore for the development of **40 tourism projects across 23 states** under the **Special Assistance to States for Capital Investment (SASCI)** - Development of Iconic Tourist Centres to Global Scale.

- While SASCI has been active since 2020-21, this is the first time funds have been specifically earmarked for tourism.

What is the SASCI Development of Iconic Tourist Centres to Global Scale?

- **About:** The Development of Iconic Tourist Centres to Global Scale component under the SASCI scheme focuses on developing tourism infrastructure in India, promoting less-visited sites like **Bateshwar (Uttar Pradesh)**, **Ponda (Goa)**, and **Gandikota (Andhra Pradesh)** to diversify tourism.
- **Objective:** The scheme provides **interest-free loans for 50 years to States** for developing iconic tourist centers, branding, and global marketing.
 - It aims to **boost local economies, create jobs, promote sustainable tourism** and strengthen the entire tourist value chain (includes Transportation, Accommodation, Activities, and Services) through challenge-mode projects.
- **Salient Features of the Scheme:** Funding is provided only for shortlisted proposals submitted by the State that meet the scheme's guidelines and objectives.
 - The **Ministry of Tourism** will evaluate proposals based on criteria such as **connectivity, existing tourism ecosystem, site capacity, utilities availability, project impact, financial viability, and sustainability**.
 - Proposals must follow the **challenge mode development process**.
 - The challenge mode development process selects the best proposals through **competitive evaluation based on set criteria**, ensuring high-quality, innovative projects.
 - States must provide **encumbrance-free land at no cost**. Projects must be sustainable, with long-term operation and maintenance.
 - Completion time for projects is capped at **two years**, with funds available until 31st March 2026.
 - The State Government is **solely responsible for the project's operations** and maintenance, potentially through **Public-Private Partnership (PPP) mode**.
 - States may offer incentives to attract private players for world-class tourist development.
- **Pattern of Assistance:** States can submit multiple projects, with a **maximum funding of Rs. 100 crores per project**.

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- For exceptional projects, the Ministry of Tourism may propose higher funding, subject to approval by the **Department of Expenditure (DoE)**.
- The Government of India will provide **100% of the project cost**, while States must contribute to peripheral infrastructure, safety, connectivity, and capacity building.
 - **No State will receive more than Rs. 250 crores**, with funds allocated on a first-come, first-served basis.
- **Implementation and Monitoring:** States are responsible for the implementation of projects, while the Ministry of Tourism will oversee their progress.

What is SASCI Scheme?

- **About:** The 'Scheme for Special Assistance to States for Capital Expenditure' was launched in 2020-21 due to the **Covid-19** pandemic. It was then implemented as the 'Scheme for Special Assistance to States for Capital Investment' in 2022-23 and 2023-24.
- **Objective:** Provides financial assistance to states in the form of 50-year interest-free loans.
- **Structure of the Scheme:** The scheme focuses on key development areas, including vehicle scrappage incentives, urban planning reforms, housing for police personnel, and promotion of national integration through Unity Mall projects.
 - It also supports the establishment of libraries with digital infrastructure at Panchayat and Ward levels to enhance educational access.
- **Objectives of the Scheme:** The scheme aims to boost the economy by stimulating demand and creating jobs, while accelerating key projects like the **Jal Jeevan Mission** and **Pradhan Mantri Gram Sadak Yojana** through state funding.
 - It also encourages reforms in urban planning and finance to enhance quality of life and governance in cities.

Capital Expenditure

- **Capital Expenditure (Capex)** refers to government funds for acquiring or improving physical assets like infrastructure and machinery, enhancing economic productivity and employment.
- In the Union Budget 2024-25, Rs 11.11 lakh crore (or 3.4 % of **Gross Domestic Product (GDP)**) have been allocated for capital expenditure.

India's Initiatives to Enhance Tourism Sector

- **Swadesh Darshan Scheme**
- **Draft National Tourism Policy 2022**
- **Dekho Apna Desh Initiative**
- **Ek Bharat Shreshtha Bharat**
- **Incredible India Tourist Facilitator Certification Programme**
- **E-Visa**
- **Regional Connectivity Scheme - Ude Desh Ka Aam Naagrik (RCS - UDAN)**
- **National Mission on Pilgrimage Rejuvenation and Spiritual, Heritage Augmentation Drive (PRASHAD)**
- **Assistance to Central Agencies for Tourism Infrastructure Development Scheme:** Financial assistance for developing tourism infrastructure and cultural tourism.
- **Domestic Promotion & Publicity including Hospitality (DPPH) scheme:** Supports States/UTs in organizing tourism events, fairs, and festivals.

Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024

Why in News?

Recently, the **Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024**, were released under the **Telecommunications Act, 2023**.

- It aims to regulate telecom networks designated as **Critical Telecommunication Infrastructure (CTI)** based on their potential impact on **national security, economy, public health, or safety**.
- In another development, **Telecommunications (Temporary Suspension of Services) Rules, 2024** came into effect replacing the **Telecom Suspension Rules, 2017**.

What are the Provisions of the Telecommunications (CTI) Rules, 2024?

- **Data and Network Access:** Telecom entities whose networks are designated as CTI must give access to government-authorised personnel to **inspect hardware, software and data** of certified CTI parts.

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- **Oversight and Reporting:** The rules require appointment of a **chief telecom security officer (CTSO)** to oversee implementation.
 - Entities must report **cyber security incidents** within **6 hours**.
- **Required Documentation:** The telecom entity must provide the government with CTI **network details, authorized personnel, hardware/software inventory, vulnerabilities**, crisis management plans, security audits, compliance reports, and service level agreements (SLAs).
- **Repair and Upgradation:** Remote repair or maintenance of CTI from outside India requires **prior written government approval**.
 - For upgrades to **software or hardware**, entities must submit **test reports** for government review.
- **Government Standards:** All CTI hardware, software, and spares must comply with government standards, including **Essential, Interface, and Security Assurance Requirements**, and other notified standards.

What are Telecommunications (Temporary Suspension of Services) Rules, 2024?

- **Mandatory Publication:** All orders suspending telecom services, including internet shutdowns, must be published with **specific reasons, geographical area, and duration**.
 - The suspension duration cannot exceed **15 days**.
- **Competent Authority:** The suspension order can only be issued by the “competent authority,” which is the **union home secretary** for the **central government** and the **state home secretary** for **states**.
- **Review Mechanism:** A **review committee** is required to meet within **5 days** of an order’s issuance to review its validity.
 - The central review committee is chaired by the **cabinet secretary** while the state committee is chaired by the **chief secretary**.
- **Nodal Officers:** Licensed service providers must appoint a **nodal officer** per service area **to receive and implement suspension orders**.
- **Secure Communication:** Only officers ranked **superintendent of police** or higher can communicate these orders, in **writing or via secure electronic means**.

Note: In the *Anuradha Bhasin v. Union of India, Case 2020*, the **Supreme Court** emphasized that government-imposed **restrictions on Internet** access must be **temporary, limited, lawful, necessary, and proportionate**.

Assessing Universal Basic Literacy in India

Why in News?

Recently, the **79th** round of the **National Sample Survey (NSS)**, conducted between July 2022 and June 2023, revealed that **95.9% of individuals aged 15–29** in India possess basic literacy and numeracy skills.

- The survey assesses the literacy and basic numeracy skills of Indians focusing on reading, writing, and arithmetic abilities.

What are the Key Findings of the Survey?

- In **rural areas**, **95.3%** of individuals have basic literacy and numeracy skills, compared to **97.4% in urban areas**.
 - Specifically, **97.4% of rural males** and **93.4% of rural females** possess these skills, while in **urban areas**, **98% of males** and **96.7% of females** meet this standard.
- States like **Mizoram (100%)**, **Goa (99.9%)**, and **Sikkim (99.9%)** lead in literacy rates, while **Bihar (91.9%)** and **Uttar Pradesh (92.3%)** lag behind.

Note: The NSS defines literacy as the **ability to read, write, and understand a simple message in any language**.

- The term “**universal**” generally implies full or near-complete coverage, typically close to 100%.
- As per **UNESCO**, literacy extends beyond reading, writing, and counting; it’s a continuous skillset involving identification, understanding, and communication, expanding to digital, media, and job-specific skills in our fast-changing, information-rich world.

What are the Government Strategies to Enhance Literacy and Numeracy Rates?

- **ULLAS (Understanding of Lifelong Learning for All in Society)**
- **National Education Policy (NEP) 2020**

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- **New India Literacy Programme**
- **National Programme on Technology Enhanced Learning**
- **Sarva Shiksha Abhiyan**
- **PRAGYATA**
- **National Literacy Mission (NLM):** The NLMA manages the **Saakshar Bharat Programme (SBP)**, which enhances adult literacy across India by focusing on functional literacy for daily life skills.

How Universal is Universal Basic Literacy?

- **Inconsistent Definitions:** The term “basic literacy” lacks a universally accepted definition. For instance, the **National Literacy Mission** defines literacy as the ability to read and write in any language, which appears to be a very narrow interpretation of literacy.
- **Data Inconsistency:** According to the **NSS, 95.9% of youth possess basic literacy** and numeracy skills, indicating near-universal proficiency.
 - However, the **Annual Status of Education Report (ASER) 2023** highlights a contrasting scenario, with **29% of students aged 14–18 in Class 10 or below unable to read at a second-grade level.**
- **Sampling Bias:** Many literacy assessments suffer from sampling bias, where certain demographics (e.g., rural populations, marginalized communities) are underrepresented.
 - For individuals never enrolled in formal education, NSS's questions determine their ability to read and write based on self-reporting without formal tests.
 - For those enrolled in formal education, literacy was assumed if they had completed at least pre-primary or Class 1, without verifying their ability to read and write.
 - This method may not accurately reflect basic literacy skills.
- **Disability Exclusion:** Existing frameworks often overlook the needs of individuals with disabilities.
 - Non-accounting of literacy programs for this demographic leads to gaps in understanding their unique challenges and barriers to achieving basic literacy.

What are the Socio-Economic Implications of Literacy Levels in India?

- **Economic Growth:** High literacy rates contribute to economic development by enhancing workforce productivity and innovation.
 - A literate population is better equipped to engage in skilled labour, which is essential for India's transition to a **knowledge-based economy.**
- **Social Empowerment:** Literacy empowers individuals, particularly women, by providing access to information and resources necessary for making informed decisions.
 - It plays a critical role in **reducing poverty levels** and **improving health outcomes** within communities.
 - The **World Bank** says **universal primary education** could reduce extreme poverty by **12%.**
- **Regional Disparities:** Significant regional variations exist, with states like **Bihar and Uttar Pradesh** showing lower literacy rates that can hinder overall national progress.
- **Long-term Development Goals:** The findings align with the **United Nations Sustainable Development Goals (SDGs-4).**
 - Ensuring universal access to quality education is vital for sustainable development and social equity.
- **Health and Well-being:** Literacy enhances health outcomes as literate individuals better understand health information, access services, and make informed choices.
 - **Educated women are 50% more likely to immunize their children,** improving future generations' health.
- **Social Cohesion and Stability:** Literacy enhances social cohesion by encouraging critical thinking and reducing social tensions.
 - **Institute of Social Studies Trust (ISST)** found communities with **higher literacy rates** have lower violence and social unrest levels.

What Strategies Can Enhance Literacy and Numeracy Rates in India?

- **Standardised Definitions and Metrics:** Establishing a universal definition of basic literacy and **standardised metrics for assessment** can help create a more coherent framework for measuring progress across different regions.

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- **Inclusive Assessment Practices:** Developing assessment tools that account for diverse learning environments and populations, **including those with disabilities, can provide a more accurate picture of literacy levels.**
- **Strengthening Teacher Training:** Investing in teacher training equips educators with essential skills, especially in resource-limited rural areas. Continuous professional development keeps teachers updated on best practices like **Finland and Singapore.**
- **Community Engagement Programs:** Initiatives that involve local communities in promoting education can foster a culture of learning and increase enrollment rates.
 - The **Sarva Shiksha Abhiyan (SSA)** aims to promote inclusive education, but expanding these centers can further support marginalized groups.
- **Leveraging Technology:** Utilising digital platforms like **SWAYAM Prabha portal** for educational content delivery can enhance access to learning resources, especially in remote areas.
 - Mobile learning applications like **E-PG Pathshala** can be developed to provide interactive learning experiences for youth.
 - The **Digital India initiative** aims to bridge the digital divide, ensuring that students have access to online resources.
- **Quality of Education:** The **Kothari Commission** advocated for a curriculum that is relevant to the needs of society and the economy.
 - **Updating curricula** to include **practical skills and contemporary knowledge** can help students become more employable and engaged in their communities.

India's Cooperative Movement

Why in News?

As India prepares to host the **International Cooperative Alliance (ICA) Global Conference** in November 2024, organised by **Indian Farmers Fertilizer Cooperative (IFFCO)** with support from **18 ICA member organisations**. The event aims to promote the cooperative movement, which includes over 800,000 societies across 29 sectors.

What are Cooperative Societies?

- **About:**
 - A **cooperative society** is a **voluntary, member-owned organisation** formed to meet common economic, social, and cultural needs.
 - Cooperatives emphasise **self-help, mutual assistance, and community welfare**, which distinguishes them from profit-driven enterprises.
- **Historical Evolution of the Cooperative Movement:**
 - **Pre-Independence Era:** Cooperative principles existed informally through local initiatives, such as **Chit Funds, Mutual-Loan Associations** in Madras, and community management of resources like **village tanks or forests** known as **Devarai or Vanarai**. However, formal legislation began in the early 20th century.
 - In the **Madras Presidency, Mutual-Loan Associations**, known as '**Nidhis**', were formed to offer financial assistance.
 - In **Punjab**, a cooperative society was created in 1891 to oversee common village land for the benefit of all co-sharers.
 - In **1904, the Cooperative Credit Societies Act** legally recognized cooperatives in India, setting guidelines for their formation, membership, profits, and dissolution. However, it excluded non-credit and other societies.
 - The **Government of India Act, 1919**, empowered provinces to legislate on cooperatives, resulting in the **Bombay Cooperative Society Act, 1925**, the first provincial cooperative law.
 - The **Cooperative Societies Act of 1912** expanded to include marketing, handloom, and artisan societies.
 - In **1914, the Maclagan Committee** proposed a three-tier cooperative banking system for the Centre, Province, and District levels.
 - In **1942**, India enacted the **Multi-Unit Cooperative Societies Act** to regulate multi-province cooperatives, delegating Central Registrar powers to State Registrars for practicality.
 - **Post-Independence Era:** Post-Independence, India aimed to decentralize economic power and promote public participation in economic development with a focus on social justice. Cooperatives became key

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in **Five-Year Plans**, starting with the **First Plan**, coordinating with village panchayats.

- The establishment of **National Cooperative Development Corporation (NCDC)** in 1963 and **NABARD** in 1982 were crucial milestones for supporting rural credit and cooperative development.
 - In 1984, India passed the **Multi-State Cooperative Organisations Act** to unify cooperative laws, further consolidated by the **2002 National Policy on Cooperatives** for legal harmonization.
- The **Multi-State Cooperative Societies (MSCS) Amendment Act 2023** aims to enhance governance, transparency, and structural changes in Multi-State Cooperative Societies, granting cooperatives greater independence.
- **97th Constitutional Amendment Act of 2011**, established the right to form cooperative societies as a **fundamental right (Article 19)**.
- Introduced a new **Directive Principle of State Policy** on Cooperative Societies (**Article 43-B**).
- Added a new **Part IX-B** to the Constitution titled “**The Co-operative Societies**” (**Articles 243-ZH to 243-ZT**).
- Empowered Parliament to enact laws governing **multi-state cooperative societies (MSCS)** and delegated authority to state legislatures for other cooperative societies.
- The **Ministry of Cooperation**, established in **2021**, has further reinforced the government’s commitment to supporting cooperatives as a key driver of economic progress.

What are the Types of Cooperatives in India?

- **Consumers’ Cooperatives:** Offer goods at reasonable prices by directly sourcing from producers, cutting out the middlemen. e.g., **Kendriya Bhandar**.
- **Producers’ Cooperatives:** Assists small producers by supplying essential production materials, including raw materials and equipment.
- **Cooperative Marketing Societies:** Help small producers sell their products collectively, e.g., **Anand Milk Union Limited (AMUL)**.
- **Cooperative Credit Societies:** Provide financial services like savings and loans, e.g., **Urban Cooperative Banks**, **Village Service Cooperative Society**.

- **Cooperative Farming Societies:** Help small farmers gain the benefits of large-scale farming, e.g., **lift-irrigation cooperatives**, **cooperatives and pani-panchayats**.
- **Housing Cooperative Society:** Provides cost-effective housing options by acquiring and developing land for its members, e.g. **Employees’ Housing Societies** and **Metropolitan Housing Cooperative Society**.

What are Some Recent Developments and Key Initiatives About Cooperatives in India?

- **Ministry of Cooperation’s Role:**
 - Launched **Sahakar Se Samridhhi** (Prosperity through Cooperation) to connect every village to cooperatives.
 - **Model Bye-Laws** for **Primary Agricultural Credit Societies (PACS)** to improve governance and enhance inclusivity.
 - **Computerization of PACS** through a Rs 2,516 crore project to modernize and link 63,000 **PACS** with **NABARD**.
 - Establishment of new **Multipurpose PACS** in rural areas to serve various functions such as **dairy**, **fisheries**, and **grain storage**.
- **Government’s Efforts for Strengthening Cooperatives:**
 - **Decentralized Grain Storage Plan:** Establishing warehouses and agri-infrastructure at the **PACS** level to reduce waste and transportation costs.
 - **Formation of Farmer Producer Organizations (FPOs):** Empowering farmers with better market linkages.
 - **PM Bhartiya Jan Aushadhi Kendra:** PACS are being used to provide affordable medicines through **Janaushadhi Kendras**.
 - **PM-KUSUM Convergence:** Enabling PACS members to adopt **solar pumps** for irrigation, promoting sustainable farming practices.
- **Impact on Rural Development and Financial Inclusion:**
 - **Cooperatives for Financial Inclusion:** Cooperatives like **Urban and Rural Cooperative Banks** play a crucial role in providing affordable credit, particularly to farmers and small entrepreneurs who are excluded from mainstream banking services.
 - **Empowerment of Women and Marginalised Communities:** Women’s cooperatives and rural cooperatives focus on creating economic opportunities and improving living standards in underserved areas.

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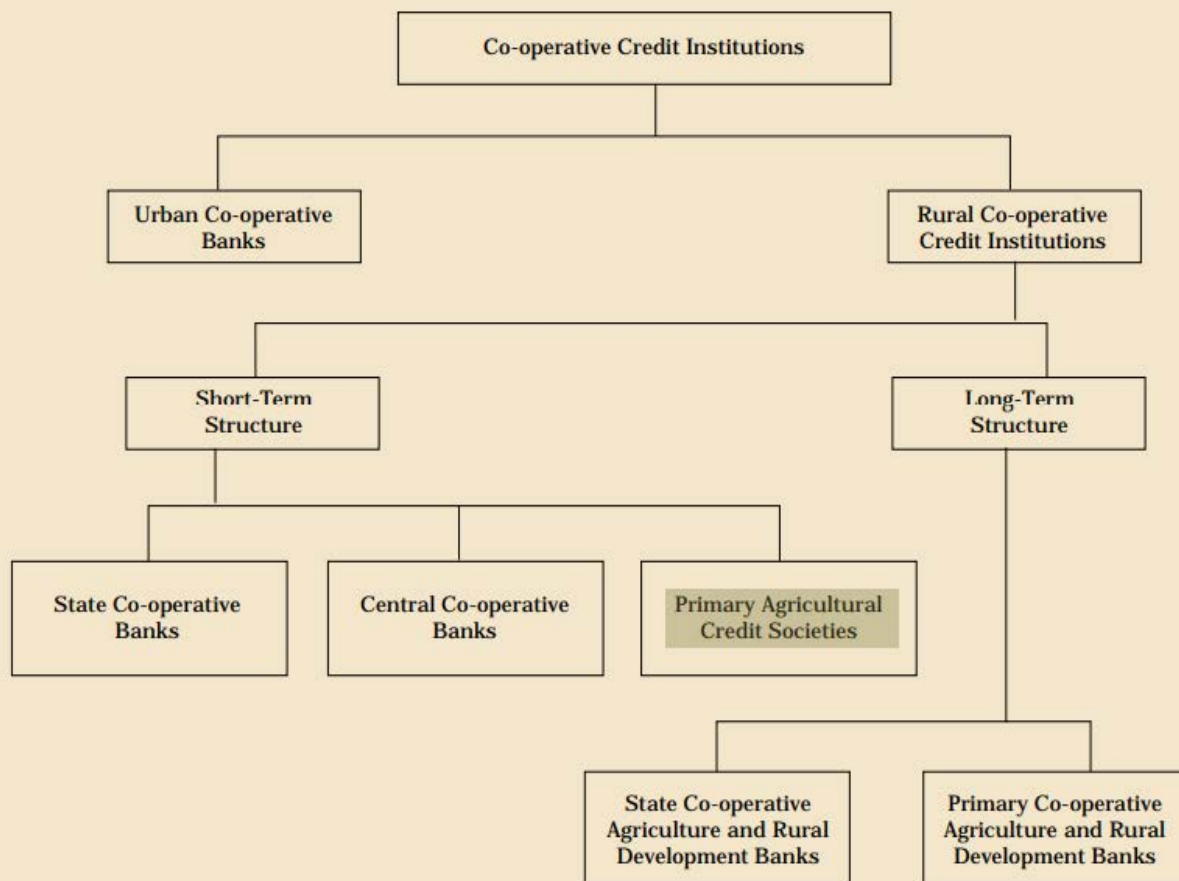
Examples of Cooperatives in India

- **HOPCOMS (Horticultural Producers' Cooperative Marketing and Processing Society):** HOPCOMS, is a farmers' society founded in 1965 for the direct marketing of farm produces. It is headquartered in Bengaluru.
- **Lijjat Papad (Shri Mahila Griha Udyog Lijjat Papad):** An inspiring women's cooperative empowering women through papad (Indian lentil cracker) production
- **Indian Coffee House:** It is a restaurant chain in India run by a series of worker co-operative societies. The chain was started by the Coffee Cess Committee, with the first outlet—then named 'India Coffee House'—opening in Churchgate, Bombay, in 1936. It was operated by the Indian Coffee Board.

Primary Agricultural Credit Societies

- PACS are village level cooperative **credit societies** that serve as the last link in a three-tier cooperative credit structure headed by the **State Cooperative Banks (SCB) at the state level**.
 - The **first PACS was formed in 1904**.
- Credit from the SCBs is transferred to the **District Central Cooperative Banks (DCCBs)**, that operate at the **district level**. The DCCBs work with PACS, which deal directly with farmers.
- PACS provide **short-term, and medium-term agricultural loans** to the farmers for the various agricultural and farming activities.

Structure of Co-operative Credit Institutions



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What are the Challenges Faced by the Cooperatives?

- **Governance Challenges:** Cooperatives struggle from the challenges of lack of transparency, accountability, and democratic decision-making processes.
- **Limited Access to Financial Resources:** Many cooperatives, particularly those serving marginalised communities, face challenges in accessing financial resources.
 - They often **lack collateral or formal documentation** required by traditional financial institutions, making it difficult to obtain loans.
- **Socio-economic Disparities and Exclusion:** Cooperatives often face issues related to **lack of inclusivity, existence of structural inequalities** etc.
- **Infrastructural Constraints:** Infrastructural constraints and **lack of connectivity** affects their efficiency and effectiveness leading to limited outreach.
- **Lack of Technical and Managerial Capacities:** Lack of training and skill development initiatives is another challenge that leads to outdated human resources.
- **Low Awareness and Participation:** Lack of awareness about the cooperative model and its benefits among potential members **limits their participation**.
- **Political Interference:** Political interference in the functioning of cooperatives undermine their autonomy and impact their ability to serve members' interests effectively.

ICA Global Cooperative Conference 2024

Why in News?

Recently, India hosted the **International Cooperative Alliance (ICA) Global Cooperative Conference** in New Delhi for the first time in the organization's 130-year history.

- The **UN International Year of Cooperatives 2025** was launched at the event.

What are the Key Highlights of ICA Global Cooperative Conference 2024?

- **About:** The conference provides a platform for **leaders, policymakers, and stakeholders** to address issues, share practices, and strategies for advancing the cooperative movement.

- It is organised by the **International Cooperative Alliance (ICA)**. ICA was established in **1895** to promote the **cooperative model**.
- **Theme:** The theme of the conference is **"Cooperatives Build Prosperity for All,"** which aligns with the Indian Government's vision of **"Sahkar Se Samriddhi" (Prosperity through Cooperation)**.
- **Organisations Involved:** The event was organised by **Indian Farmers Fertiliser Cooperative Limited (IFFCO)** in collaboration with **International Cooperative Alliance (ICA)**, **AMUL**, **KRIBHCO** (national level cooperative society), and the Government of India.
- **UN International Year of Cooperatives 2025:** India's Prime Minister launched the **UN International Year of Cooperatives 2025**, centered on the theme **"Cooperatives Build a Better World."**
- **Postal Stamp:** A commemorative postal stamp featuring a **lotus** was launched. The **five petals** of the lotus represent the five elements of **nature (Panchatatva)**, highlighting cooperatives' commitment to **environmental, social, and economic sustainability**.
 - Panchatatva includes **earth, water, fire, air, and space**.

Cooperatives in India

- **Constitutional Provision:** **97th Constitutional Amendment, 2011** gave **constitutional status** and protection to cooperatives in India.
 - **Part IX B (Articles 243-ZH to 243-ZT)** was added to the Indian Constitution which deals with **cooperative societies** and their functioning.
 - It made the **right to form cooperative societies** a fundamental right under **Article 19 (1)**.
 - A new **Directive Principle of State Policy, Article 43-B**, was introduced to promote cooperative societies.
- **Promotion of Cooperatives:** The **Ministry of Cooperation** was constituted in **2021** to **strengthen** cooperative movement and deepen its reach up to grassroots.
 - The Union government plans to establish a **cooperative university** and it also plans to unveil a **new cooperative policy**.
- **Contribution of Cooperatives:** India has **over 8 lakh cooperatives**, and **98% of rural areas** are covered by them.
 - About **300 million people** are associated with cooperatives in India.

Note:



SC Upholds EVM and VVPAT System

Why in News?

Recently, the **Supreme Court (SC)** dismissed a PIL which sought re-introduction of **ballot papers** in place of **Electronic Voting Machines (EVMs)** and **Voter verifiable paper audit trail (VVPAT)**.

- SC emphasized that **EVMs** are often **questioned only** in the wake of **electoral losses**, reaffirming confidence in their mechanism and the safeguards in place.

What is the Controversy Regarding EVMs?

- **Controversy:** Some political parties have claimed **EVM tampering** before elections, especially **after losing**, raising doubts about their **reliability**.
 - In **2009**, the losing party in the **2009 General elections** raised concerns about the **reliability of EVMs**.
 - Following the conclusion of voting in the **2019 Lok Sabha elections**, the **opposition parties** have again **raised** the issue of integrity of **EVMs**.
 - In **2020**, the controversy **resurfaced** after assembly elections in **five states**.

➤ **Election Commission's Response:** The Election Commission has consistently **defended the reliability** of EVMs citing studies by technical experts to assert that the machines **cannot be hacked or tampered with**.

➤ **Supreme Court Response:** SC held that a number of **technical safeguards and administrative protocols** with **stringent checks** have been put in place to **prevent EVM tampering** and rejected the plea for a return to **ballot papers as unsound**.

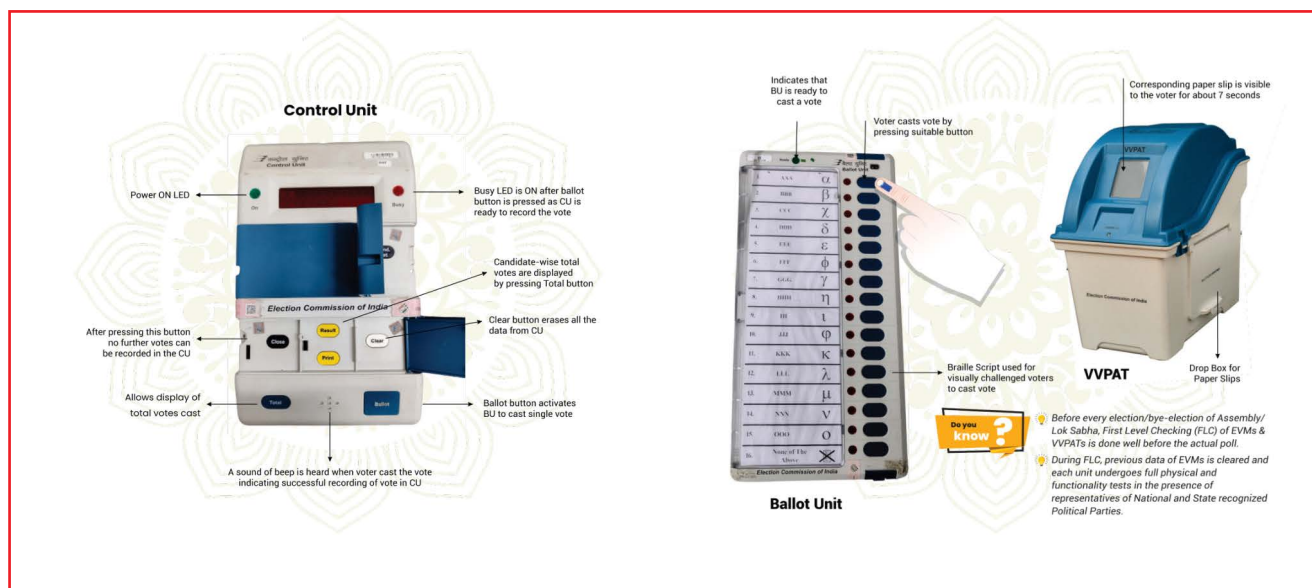
What are EVMs and VVPATs?

- **About EVMs:** EVMs are **portable** instruments for the purpose of **conducting elections** to the **parliament, state legislature** and local bodies like **panchayats and municipalities**.
 - It is a **microcontroller-based instrument** and is designed for a **single post and a single vote**.
- **Components of EVMs:** An EVM is designed with **two units** i.e., the **control unit and the ballot unit**. These units are joined together by a **cable**. It ensures that the polling officer **verifies your identity**.
 - **Control Unit:** The control unit of the EVM is kept with the **presiding officer or the polling officer**.
 - **Ballot Unit:** The balloting unit is kept within the **voting compartment for electors** to cast their votes.

Note:



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➤ Evolution of EVMs in India:

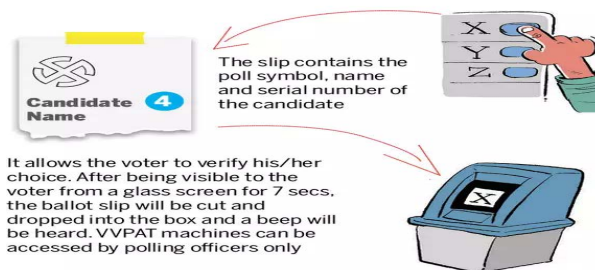
Year	Event
1977	Concept of EVM conceived .
1979	Prototype developed by ECIL, Hyderabad.
1980	EVMs demonstrated by the Election Commission in August ; directives issued under Article 324 .
1982	EVMs used in Kerala's Parur by-elections ; legality challenged by the SC.
1988	Representation of People Act amended (Section 61A) to empower ECI to use EVMs.
1990	The Dinesh Goswami Committee recommended EVMs as technically sound and secure.
1998	EVMs used in 16 Assembly elections.
1999-2000	Expanded use in 46 parliamentary seats (1999) and Haryana Assembly polls (2000).
2001	Full use in Tamil Nadu, Kerala, Puducherry, and West Bengal Assembly elections.
2004	EVMs used nationwide in Lok Sabha elections .
2013	VVPAT was introduced via amendment to the Conduct of Election Rules ; first used in Nagaland by-election .
2019	First Lok Sabha election fully backed by VVPAT.

- **About VVPAT:** VVPAT enables voters to **confirm** that their votes are **recorded as intended**.

- When a vote is cast, a slip showing the **serial number, candidate's name, and symbol** is printed.
- It is visible through a transparent window for **7 seconds** before being **automatically cut and stored** in a sealed box.

How do VVPAT machines work?

When a voter presses a button in the EVM, a paper slip is printed through the VVPAT



What are the Various Safeguards to Ensure EVM Integrity?

➤ Technical Safeguards:

- **Functionality:** EVMs consist of a **Control Unit (CU), Ballot Unit (BU), and VVPAT**.
 - VVPAT allows visual verification by printing a slip with the candidate's **name, symbol, and serial number**.
- **Microcontroller Security:** The microcontrollers are **One-Time Programmable (OTP)** and cannot be altered after manufacturing.
 - **Any physical attempt** to access the microcontroller **disables the machine permanently**.

Note:

- **Manufacturing:** Only trusted Public-Sector Undertakings (PSUs) like **Bharat Electronics Limited (BEL)** and **Electronics Corporation of India Limited (ECIL)** manufacture EVMs.
- **Standalone Operation:** EVMs operate **without wired or wireless connectivity**, eliminating remote manipulation risks.
- **Advanced M3 EVMs (Post-2013):** It features **tamper detection** to disable the machine if accessed unauthorizedly, and **mutual authentication** to block unauthorized devices.
- **EVM Management System (EMS 2.0):** It tracks and manages EVM movements, ensuring security during **transportation and storage**.
- **Administrative Protocols:**
 - **First-Level Check (FLC):** Visual inspection, cleaning, and functionality tests are conducted by engineers from BEL/ECIL.
 - **Dummy symbols** are loaded for **mock polls** to verify performance.
 - **Randomised EVM Allocation:** EVMs are **randomly allocated** to assembly constituencies and polling stations to **avoid predetermined assignments**.
 - Randomisation is done using the **EMS 2.0 system** in the presence of **Election Commission** observers.
 - **Candidate Setting:** Candidate details in EVMs, called '**Commissioning**', are loaded only after the final candidate list is available.
 - **Mock Polls** are conducted at multiple stages, including before polling day, to ensure accuracy.
 - **Counting Day Procedures:** EVMs are brought to counting tables under **CCTV surveillance**.
 - Random **cross-verification of VVPAT slips from 5 polling stations per assembly constituency** is conducted.
 - **EVM Storage Protocols:** Stored in strongrooms with **single entry/exit points**, under CCTV and armed police surveillance.

- **Double-lock systems** are employed, with keys held by separate officials, and **GPS-tracked vehicles** are used to transport EVMs after polling.

- **Periodic Inspections:** District Election Officers conduct **monthly inspections** of EVM warehouses to ensure secure storage conditions.

What are Advantages of the EVM-VVPAT Over Ballot Papers?

- **No External Input:** EVMs run on **batteries or power packs**, making them operational in **remote areas**, unlike paper ballots, which require lighting and other facilities for manual counting.
- **Elimination of Invalid Votes:** Voting on EVMs is done by pressing a button, ensuring **no invalid votes**, a problem often associated with incorrectly marked or torn ballot papers.
- **Prevention of Booth Capturing:** EVMs are programmed to allow **only four votes per minute**, making rapid fraudulent voting in **booth-capturing** scenarios **highly unlikely**.
 - Once the '**Close**' button on the control unit is pressed, **no further votes can be cast**.
- **Accurate Counting and Voter Verification:** EVMs facilitate **fast and error-free counting of votes**, **eliminating** the manual errors and delays.
 - Voters get **instant feedback** via a beep and can verify their vote through the VVPAT slip.
- **Transparency in Vote Count:** The Control Unit's '**Total**' button displays the number of votes cast without revealing candidate-wise results, ensuring **transparency** while maintaining the secrecy of votes.
- **Prevention of Pre-Programming Manipulation:** The EVM's original program, which is neutral to political parties and candidates, is embedded in the **microcontroller** during manufacturing, long before elections.
 - The **inability** to know candidate **serial numbers in advance** makes it **impossible** to **pre-program** EVMs for spurious purposes.

Note:





Note:

ELECTORAL REFORMS IN INDIA

ELECTORAL REFORMS ARE CHANGES MADE TO IMPROVE THE ELECTION PROCESS AND ENSURE FAIRNESS.

Electoral Reforms Before 1996

- ➔ **Model Code of Conduct (1969):** Guidelines to regulate political parties and candidates prior to elections
- ➔ **61st Constitutional Amendment Act (1988):** Lowering of the voting age from 21 to 18 years
- ➔ **Electronic Voting Machines (EVMs) (1989):** Switched from individual colored ballot boxes to ballot papers, and later to EVMs
- ➔ **Booth Capturing (1989):** Provision for adjournment of poll or countermanding of elections in such cases
- ➔ **Elector's Photo Identity card (EPIC) (1993):** Electoral roll is the basis to issue EPIC to registered electors
- ➔ **ECI- A Multi-member Body (1993):** Election commissioners were appointed in addition to CEC

Electoral Reforms of 1996

- ➔ **Time-limit for By-elections:** Elections must occur within 6 months of any vacancy in a legislative house
- ➔ **Listing of Names of Candidates:** Contesting candidates categorized into 3 groups for listing
 - ➔ Recognised & registered-unrecognised political parties
 - ➔ Other (independent)
- ➔ **Disqualification for Insulting the National Honour Act, 1971:** Leads to election disqualification for 6 years upon:
 - ➔ Insulting the National Flag, Constitution of India or preventing the singing of National Anthem

Electoral Reforms After 1996

- ➔ **Vote Through Proxy (2003):** Service voters in Armed Forces & forces under Army Act can vote by proxy
- ➔ **Allocation of Time on Electronic Media (2003):** Equitable sharing of time on electronic media during elections to address the public
- ➔ **Introduction of Braille Signage Features in EVMs (2004):** To facilitate the visually impaired voters to cast their votes without an attendant

Electoral Reforms Since 2010

- ➔ **Voting Rights to Indian Citizens Living Abroad (2010)**
- ➔ **Online Enrollment in Electoral Roll (2013)**
- ➔ **Introduction of NOTA option (2014)**
- ➔ **VVPAT Voter Verified Paper Audit Trail (2013):** Introduction of VVPAT with EVMs to conduct free and fair elections
- ➔ **Photos of Candidates on EVMs and Ballot Papers (2015):** To prevent confusion in constituencies with namesake candidates
- ➔ **Introduction of Electoral bonds (2017 Budget):** An alternative to cash donations for political parties
 - ➔ Declared as unconstitutional by SC (2024)
- ➔ **Launch of Electronic EPIC (2021)**
- ➔ **Home Voting for People with Disabilities & Those Above 85 years of Age (2024)**

IMPORTANT COMMITTEES/ COMMISSION

Committees/ Commission	Year	Purpose
■ Tarkunde Committee	1974	■ By Jaya Prakash Narayan (JP) during the "Total Revolution" movement.
■ Dinesh Goswami Committee	1990	■ Electoral Reforms
■ Vohra Committee	1993	■ On the Nexus between Crime and Politics
■ Indrajit Gupta Committee	1998	■ State Funding of Elections
■ Second Administrative Reforms Commission of India	2007	■ Report on Ethics in Governance (Headed by Veerappa Moily)
■ Tankha Committee (Core Committee)	2010	■ To look into the whole gamut of the election laws & electoral reforms.



Design Law Treaty (DLT)

Why in News?

Recently, the member states of the **World Intellectual Property Organization (WIPO)** including **India** adopted the **Design Law Treaty (DLT)** at the Diplomatic Conference to Conclude and Adopt the Design Law Treaty held in **Riyadh, Saudi Arabia**.

Note:



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State of India's Intellectual Property

- **India's Innovation Ranking:** WIPO's **Global Innovation Index (GII) 2024** ranked India **39th among the 133 economies** featured in the **GII 2024**.
 - India ranked **1st** among the 10 economies in **Central and Southern Asia**.
- **India's Global IP Ranking:** India ranks in the **global top 10** for all three major intellectual property rights—**patents, trademarks, and industrial designs**.
 - India ranks **sixth globally** with **64,480 patent applications** in 2023.
 - India's trademark office holds the **second-largest number of active registrations worldwide** with **over 3.2 million trademarks** in force.
 - India's industrial design applications grew by **36.4%** in 2023.
- **Increase in IP Activity:** India's **patent-to-GDP ratio** grew from **144 to 381** in the past decade, indicating an expansion of IP activity in line with economic growth.
 - Patent-to-GDP ratio is a measure of the economic impact of patent activity.

What is the Design Law Treaty (DLT)?

- **About:** DLT is proposed as a comprehensive framework to streamline and facilitate the **protection of industrial designs** worldwide.
- **Objective:** Its objective is to create a **predictable and accessible system** that eliminates unnecessary bureaucratic hurdles and offers greater ease for designers to protect their intellectual property.
- **Key Provisions:**
 - Streamlining Design Application Procedures:
 - **Clear Application Requirements:** Establishes **uniform, clear guidelines** for all design applications.
 - **Flexibility in Representation:** Applicants can use various formats (**drawings, photos, videos**) to **represent the design** to industrial property offices.

- **Multiple Use:** Allows **multiple designs in one application**, preserving the original filing date even if some are not accepted.

○ Improving the Filing Process:

- **Filing Date Simplicity:** Applicants can secure a filing date by submitting **essential parts initially**, with the complete application processed later.
- **Grace Period for Public Disclosure:** A **six or 12-month grace period** protects the novelty of designs disclosed before filing.

○ Post-Registration Procedure and Protection:

- **Publication Control:** Applicants can control publication for **six months post-filing**, ensuring confidentiality and competitive advantage.
- **Relief Measures for Missed Deadlines:** Relief will be provided for applicants who **miss deadlines**, preventing loss of rights.
- **Clear Post-Grant Transactions:** Post-registration procedures (e.g., transfers, licensing) will be clearly defined for easier management and enforcement.
- **Two-Tier Structure:** The Treaty will consist of **articles** (the main provisions of the Treaty) and **rules** (the regulations governing implementation).
 - The Assembly of **Contracting Parties** can amend the rules to **adapt to changes** in design law and technology.

What is Industrial Design?

- **About:** An industrial design is an **original creation** of an **ornamental nature**, which, when **incorporated in or applied to a product**, lends a **special appearance** to it.
 - These characteristics may result from its **shape, lines, outline, configuration, colour, texture or material**.
 - A design may be **three-dimensional**, such as the shape of a product, or **two-dimensional**, as in a specific surface pattern.
 - It is an **Intellectual property (IP)** which are **intangible creations** of the human mind that have value but are not physical objects.
- **Application:** Designs are applied to a wide range of products, such as **packaging, furniture, clothing, electronic devices, medical equipment, handicraft items, and jewelry**.

Note:

- **Importance:** Designs are **business assets** that may increase a product's **market value** and provide a competitive advantage.
 - By making products attractive to consumers, designs **drive consumer choices**.
- **Protection:** Designers need to follow the filing procedures set by the **intellectual property (IP) office** of the country in which they seek protection.
 - Design rights are **territorial** i.e., the rights arising from protection obtained in one **country (or region)** are limited to that country (or region).
 - The registration and protection of industrial designs in India is administered by the **Designs Act, 2000**.
- **Industrial Design In India:** Between **2014-24**, design registrations in India have **tripled**, with domestic filings increasing by **120%** in the **last two years** alone.
 - Notably, design applications grew by **25% in 2023**.

World Intellectual Property Organisation (WIPO)

- **About:** WIPO is an **specialised agency** of the **United Nations** which was created in **1967** to encourage **creative activity**, to promote the protection of **intellectual property** throughout the world.
- **Role:** Provides services for protecting IP, offers a forum for IP-related issues, and supplies data and information to guide global decision-making.
- **Membership:** It has **193 member states**. India joined WIPO in 1975.

What are Protection Provisions under the Design Act, 2000?

- **Eligibility:** Designs are protected if they are **aesthetic in nature and applied to articles**.
 - Protection only applies to the appearance of an article, **not its functional aspects**.
 - Designs must be registered with the **Design Registry** to receive protection.
- **Requirements for Protection:**
 - **Novelty and Originality:** Design must be new and significantly different from existing designs.
 - **Non-Disclosure:** Design should not have been publicly disclosed in India or abroad.

- **Not Functional:** Designs driven by functionality are not protected.
- **Not Offensive:** Designs should not conflict with public morals, security, or integrity.
- **Duration of Protection:** Protection lasts for at least **10 years** under the **TRIPS Agreement** which can be extended for an additional **5 years** through a renewal application.
- **Infringement and Enforcement:** Registered design owners can **prevent** others from **making, selling, or importing products** that **copy or imitate** their design.
- **Excluded Designs from Protection:** Certain items like **stamps, calendars, books, flags, and layout designs of integrated circuits** are excluded from industrial design protection.
 - Design **cannot** include a **trademark, property mark, or any artistic rights** as defined under the **Copyright Act, 1957**.

Judgements of Industrial Design

- **Ritika Private Limited v. Biba Apparels Private Limited Case, 2016:** Ritika, a boutique apparel designer, sued Biba for reproducing and **selling garments** in the Delhi high court that **duplicated Ritika's designs**, despite the designs **not** being registered under the Design Act, 2000.
 - The court ruled that the designs were **not registered** under the Design Act, 2000, and thus, there was **no infringement**, reinforcing the importance of **design registration** for protection against duplication and copying.
- **Crocs Inc. USA v. Bata India Ltd. and Ors. Case, 2019:** Crocs Inc USA filed a **design infringement** suit against various Indian footwear manufacturers in the Delhi high court. The alleged design referred to **perforated and non-perforated shoe design**.
 - The court held that Crocs Inc USA **cannot allege infringement or piracy** since the alleged design **lacks novelty and originality** because of the prior publication of the design in various mediums.

Note:



INTELLECTUAL PROPERTY RIGHTS (IPRs)

IP refers to intangible assets owned/legally protected by an individual/company from outside use or implementation without consent.



NEED FOR IPR

- Encourages Innovation
- Economic growth
- Safeguard rights of creators
- Enhances ease of doing business



RELATED CONVENTIONS/TREATIES (INDIA SIGNATORY TO ALL)

- WIPO Administered (first recognised IPR under):
 - Paris Convention for the Protection of Industrial Property 1883 (Patents, Industrial Designs)
 - Berne Convention for the Protection of Literary and Artistic Works 1886 (Copyrights)
- WTO - TRIPS Agreement:
 - Ensures adequate standard of protection
 - Argues for incentives for technology transfer to developing countries
- Budapest Treaty 1977:
 - International recognition of the deposit of micro-organisms for the purposes of patent procedure
- Marrakesh VIP Treaty 2016:
 - Facilitate access to published works by visually impaired persons and persons with print disabilities
- IPR also outlined in Article 27 (Universal Declaration of Human Rights)



INDIA AND IPRS - INITIATIVES

- National IPR Policy 2016:
 - Motto: "Creative India; Innovative India"
 - Compliant with TRIPS Agreement
 - Brings all IPRs to single platform
 - Nodal Dept - Department of Industrial Policy & Promotion (Ministry of Commerce)
- National (IP) Awareness Mission (NIPAM)
- Kalam Program for Intellectual Property Literacy and Awareness Campaign (KAPILA)

World Intellectual Property Day: 26th April

Intellectual Property	Protection	Law in India	Duration
Copyright	Expression of Ideas	Copyright Act 1957	Variable
Patent	Inventions- New Processes, Machines, etc.	Indian Patent Act 1970	20 years Generally
Trademarks	Sign to distinguish business goods or services	Trade Marks Act 1999	Can last Indefinitely
Trade Secrets	Confidential Business Information	Protected without Registration	Unlimited time
Geographical Indication (GI)	Sign used on specific geographical origin and possess qualities due to site of origin	Geographical Indications of Goods (R & P) Act, 1999	10 years (Renewable)
Industrial Design	Ornamental or aesthetic aspect of an article	Design Act, 2000	10 years

Constitution Day 2024

Why in News?

On **Constitution Day**, 26th November 2024, the Prime Minister of India joined celebrations organized by the **Supreme Court of India**, marking 75 years since the adoption of the Indian Constitution. He emphasized the **Constitution as a living document** crucial for socio-economic progress and justice.

- The occasion also commemorated the victims of the **26/11 Mumbai attacks**, underscoring India's resilience.

What is Constitution Day?

- **About:** Constitution Day marks the adoption of the Indian Constitution on 26th November 1949. It celebrates India's democratic values and promotes awareness of **justice, liberty, equality, and fraternity**.
 - In 2015, the **Ministry of Social Justice and Empowerment** declared 26th November as Constitution Day to deepen citizens' connection with the Constitution. Before 2015, 26th November was observed as **National Law Day**.
 - The day honours the **Constituent Assembly's** vision in drafting the Constitution and **Dr B.R. Ambedkar's** pivotal role as Chairman of the Drafting Committee, earning him the title "**Father of the Indian Constitution**."
- **Key Highlights of the Constitution Day 2024:**
 - **Constitution Day Celebrations in Jammu and Kashmir:** For the first time in 74 years, Jammu and Kashmir celebrated **Constitution Day**, following the abrogation of **Article 370 in 2019**.
 - The event symbolized a new chapter in the Union Territory's alignment with India's legal and political framework.
 - **Hamara Samvidhan, Hamara Samman:** The Minister of Labour and Employment participated in the "**Hamara Samvidhan, Hamara Samman**" campaign.
 - The "Hamara Samvidhan, Hamara Samman" campaign, launched on 24th January 2024, aims to deepen citizens' understanding of the Constitution and its role in shaping Indian society.
 - This is a year-long initiative promoting constitutional awareness, legal rights, and responsibilities.

- The campaign includes regional events, workshops, and seminars, along with sub-campaigns like **Sabko Nyay, Har Ghar Nyay** (justice for all), **Nav Bharat, Nav Sankalp** (new resolve for a new India), and **Vidhi Jagriti Abhiyaan** (legal awareness).

- The campaign aligns with **India's vision for a developed nation by 2047**.

- **Women of India's Constituent Assembly:** The **President of India** highlighted the contributions of 15 women members in the Constituent Assembly, including **Sarojini Naidu**, **Sucheta Kripalani**, and **Vijaya Lakshmi Pandit**.

- Lesser-known members like **Ammu Swaminathan**, **Annie Mascarene**, **Begum Qudsia Aizaz Rasul**, and **Dakshayani Velayudhan** were also recognized for shaping India's Constitution.

- **Ammu Swaminathan:** From Kerala, she entered politics after witnessing social restrictions on widows. Advocated for gender equality through the **Hindu Code Bill**, enduring male-dominated ridicule in the Assembly.

- **Annie Mascarene (1902-1963):** She campaigned for **universal adult franchise** against casteist opposition.

- **Begum Qudsia Aizaz Rasul (1909-2001):** A member of the Muslim League, she opposed **religion-based electorates** despite complex views on Partition.

- **Dakshayani Velayudhan (1912-1978):** The first Dalit woman graduate in science and the first Dalit woman in the Cochin Legislative Council. Opposed **separate electorates for Dalits**, emphasising nationalism.

What Makes the Indian Constitution a "Living Document"?

- **Amendability:** The **Indian Constitution can be amended** to address changing needs and circumstances. This flexibility allows it to evolve over time while maintaining its core principles.
 - **Provision for Amendments: Article 368 in Part XX** grants Parliament the power to amend the Constitution by addition, variation, or repeal of any provision, following the laid-down procedure.

Note:



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- Parliament cannot amend the **'basic structure' of the Constitution**, as ruled in the *Kesavananda Bharati vs State of Kerala case, 1973* by the Supreme Court.
- **Types of Amendments:** Amendments to the Constitution can be made in 3 different ways, by a **simple majority of Parliament**, by a **special majority of Parliament**, and **special majority + state ratification** for some amendments.
- Amendments under the **simple majority category** do not fall under Article 368.

Types of Majority in Parliament (II)

Special Majority

- Majority of the total membership (irrespective of vacancies/absentees) of each House and a majority of 2/3rd of the members of each House present and voting

Const. Provisions – Amended by Special Majority

- Fundamental Rights
- Directive Principles of State Policy
- All other provisions not covered under Simple Majority or under Special Majority + Consent of States

For the removal of Vice President and the Speaker/Deputy Speaker of Lok Sabha, effective majority is required (more than 50% of the total strength minus vacancies)

Special Majority + Consent of States

- Const. provisions related to the federal structure of the polity - amended by a special majority + the consent of 50% of the state legislatures by a simple majority

Const. Provisions – Amended by Special Majority + Consent of States

- President - election and its manner
- Union and States - Distribution of legislative powers and Extent of the executive power
- Supreme Court and High Courts
- GST Council
- All 3 lists in 7th Schedule
- Parliament - Representation of states, Power to amend the Constitution and its procedure (Article 368 itself)

MAJOR CONSTITUTIONAL AMENDMENTS THAT CHANGED THE COURSE OF INDIA

1951 (1ST AMENDMENT)

Introduced 9th Schedule to keep certain laws beyond the scope of judicial review

1956 (7TH AMENDMENT)

States reorganised by language; Union Territories introduced

1976 (42ND AMENDMENT)

'Socialist' and 'Secular' added in the Preamble; fundamental duties prescribed

1978 (44TH AMENDMENT)

Right to Property knocked off from the list of fundamental rights

1985 (52ND AMENDMENT)

Defection becomes illegal

1989 (61ST AMENDMENT)

Voting age reduced to 18 from 21 years

1992 (73RD AND 74TH AMENDMENT)

Direct election for Panchayats and urban local bodies

2002 (86TH AMENDMENT)

Free and compulsory education for children between 6 to 14 years

2016 (101ST AMENDMENT)

Introduction of the Goods and Services Tax (GST)

2019 (103RD AMENDMENT)

10% reservation for economically weaker upper castes



- **Judicial Interpretation:** The judiciary, particularly the Supreme Court, plays a crucial role in interpreting the Constitution.
 - Landmark judgments and evolving interpretations ensure that the Constitution remains relevant and responsive to contemporary issues.
 - Courts have interpreted provisions to meet contemporary needs, such as recognising the **Right to Privacy** as a **Fundamental Right** in the *K.S. Puttaswamy v. Union of India, 2017*
- **Federal Structure:** The federal structure of the Indian Constitution **balance of power** between the central and state governments, addressing regional needs and diversity.
 - **Article 246 outlines three lists in the Seventh Schedule: Union, State, and Concurrent.** The Centre legislates on the Union List, states on the State List, and both on the Concurrent List, with Union laws prevailing in case of conflict.
- **Hybrid Structure of the Constitution:** Certain provisions are rigid, protecting fundamental values like **federalism**, and **secularism**.

Note:

- Other provisions, such as the **Directive Principles of State Policy (DPSP)**, allow for flexible adaptation to meet the welfare needs of society.
- **Responsive to Social Change:** The Constitution of India has provisions that allow it to respond to social changes, such as the inclusion of new laws to protect **marginalized communities and promote social justice**.
- For example, the **89th Amendment Act of 2003** made the **National Commission for Scheduled Tribes (NCST)** a constitutional body under **Article 338A**, and the **National Commission for Scheduled Castes (NCSC)** a separate constitutional body under **Article 338**, enhancing their roles in creating a **more inclusive society**

What are the Key Facts about the Constitution of India?

- **Constituent Assembly:** The Constituent Assembly took nearly three years (2 years, 11 months, 17 days) to **draft the Constitution**. Initially, it had 389 members, with 292 elected from Provincial Legislative Assemblies, 93 from Princely States, and 4 from Chief Commissioners' Provinces.
- However, following the **partition of India in 1947** and the creation of **Pakistan**, a **separate Constituent Assembly was formed for Pakistan**, reducing the membership of **India's Assembly to 299**.

Important Committees of Constituent Assembly and Their Chairmen

S. No	Name of Committee	Chairman
1	Committee on the Rules of Procedure	Rajendra Prasad
2	Steering Committee	Rajendra Prasad
3	Finance and Staff Committee	Rajendra Prasad
4	Credential Committee	Alladi Krishnaswami Ayyar
5	House Committee	B. Pattabhi Sitaramayya
6	Order of Business Committee	K.M. Munsi

7	Ad hoc Committee on the National Flag	Rajendra Prasad
8	Committee on the Functions of the Constituent Assembly	G.V. Mavalankar

- **Original Structure (1949):** Initially, it contained a **Preamble**, **395 Articles (divided into 22 Parts)**, and **8 Schedules**.
 - **Current Structure:** It now includes a Preamble, more than 450 Articles (divided into 25 Parts), and 12 Schedules.
- **Amendments:** As of September 2024, there have been **106 amendments** of the Constitution of India since it was first enacted in 1950.
- **Length:** The Constitution of India is the **longest written Constitution** in the world.
 - It was handwritten by **Prem Behari Narain Raizada** in calligraphy, with pages decorated by artists from **Shantiniketan** under **Nandalal Bose's** guidance.
- **Reason for Extensive Size:** The vastness and diversity of India have necessitated a detailed constitutional document.
 - The influence of the **Government of India Act of 1935**, which itself was a comprehensive document, has contributed to the Constitution's size.
 - India's single unified Constitution, which **governs both the central and state governments**, also **added to its size**.
 - The Constituent Assembly, led by legal experts, crafted a Constitution that is both thorough in **legal and administrative aspects**, encompassing fundamental governance principles as well as detailed administrative provisions.
 - Furthermore, the Constitution draws from various **global sources**, with provisions inspired by the **American, Irish, British, Canadian, Australian, German**, and other constitutions, reflecting the broader international influence on its design.

Note:



Note:

➤ Criticisms of the Indian Constitution:

Criticism	Debunking
Borrowed Constitution	The framers adapted and modified borrowed features to suit Indian conditions , avoiding their faults.
Carbon Copy of the Government of India Act, 1935	While many provisions were borrowed, the Constitution is not a mere copy. It incorporates significant changes and additions.
Un-Indian or Anti-Indian	The Constitution reflects Indian values and aspirations, despite borrowing from foreign sources.
Un-Gandhian	While not explicitly Gandhian, the Constitution aligns with many of Gandhi's principles, particularly in the DPSP .
Elephantine Size	The Constitution's detailed nature is essential for managing India's diversity and complexity.
Paradise of the Lawyers	The legal language is essential for clarity and enforceability .

SCHEDULES IN THE INDIAN CONSTITUTION

Originally (1949), the Constitution had 8 schedules. Now, it comprises 12 Schedules; various amendments carried out since 1951 have added 4 Schedules (9th, 10th, 11th and 12th).

First Schedule

- Articles: 1 & 4
- States and Union Territories with their territorial jurisdiction

Second Schedule

- Articles: 59, 65, 75, 97, 125, 148, 158, 164, 186 & 221
- Emoluments, allowances and privileges of various constitutional posts (President, Governor, Judges of the SC & High Courts, CAG etc.)

Third Schedule

- Articles: 75, 84, 99, 124, 146, 173, 188 & 219
- Forms of oaths or affirmations (Union ministers, MPs, Judges of the SC & High Courts, CAG etc.)

Fourth Schedule

- Articles: 4 & 80
- Allocation of seats in the Rajya Sabha

Fifth Schedule

- Article: 244
- Administration and Control of scheduled areas and scheduled tribes

Sixth Schedule

- Articles: 244 & 275
- Administration of tribal areas in the states of Assam, Meghalaya, Tripura & Mizoram

Seventh Schedule

- Article: 246
- Union List (98 subjects), State List (59 subjects), & Concurrent List (52 subjects)

Eighth Schedule

- Articles: 344 & 351
- 22 recognised languages by the Constitution

Ninth Schedule (1st Amendment Act, 1951)

- Article: 31-B
- Validation of certain acts and regulations

Tenth Schedule (52nd Amendment Act, 1985)

- Articles: 102 & 191
- Anti-defection Law

Eleventh Schedule (73rd Amendment Act, 1992)

- Article: 243-G
- Powers, authority and responsibilities of Panchayats

Twelfth Schedule (74th Amendment Act, 1992)

- Article: 243-W
- Powers, authority and responsibilities of Municipalities

PARTS IN THE INDIAN CONSTITUTION

Part I (Article 1 - 4)
The Union and Its Territory

Part IV (Article 36 - 51)
Directive Principles of State Policy

Part V (Article 52 - 151)
The Union (Executive, Parliament, President, Legislative Powers of the President, Union Judiciary, CAG)

Part VIII (Article 239 - 242)
The Union Territories

Part IX-B (Article 243-ZH - 243-ZT)
The Co-operative Societies

Part XII (Article 264 - 300-A)
Finance, Property, Contracts and Suits

Part XIV-A (Article 323-A - 323-B)
Tribunals

Part XVII (Article 343 - 351)
Official Language

Part XX (Article 368)
Amendment of the Constitution

Part II (Article 5 - 11)
Citizenship

Part IV-A (Article 51-A)
Fundamental Duties

Part VI (Article 152 - 237)
The State (Executive, State Legislature, Legislative Power of Governor, High Courts, Subordinate Courts)

Part IX (Article 243 - 243-O)
The Panchayats

Part X (Article 244 - 244-A)
The Scheduled and Tribal Areas of India

Part XIII (Article 301 - 307)
Trade, Commerce and Intercourse within the Territory of India

Part XV (Article 324 - 329-A)
Elections

Part XVIII (Article 352 - 360)
Emergency Provisions

Part XXI (Article 369 - 382)
Temporary, Transitional and Special Provisions

Part III (Article 12 - 35)
Fundamental Rights

Part IX-A (Article 243-P - 243-Z6)
The Municipalities

Part XI (Article 245 - 263)
Relations between the Union and the States (Legislative and Administrative)

Part XIV (Article 308 - 323)
Services under the Union and the States

Part XVI (Article 330 - 342-A)
Special Provisions Relating - Certain Classes (SCs, STs, Backward Classes)

Part XIX (Article 361 - 367)
Miscellaneous

Part XXII (Article 393 - 395)
Short title, Commencement, Authoritative Text in Hindi Language, Repeals

Part VII (Article 238) – Omitted



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Note:

Atal Innovation Mission 2.0

Why in News?

The Union Cabinet has approved the continuation of the **Atal Innovation Mission (AIM)** under **NITI Aayog (National Institution for Transforming India)** with an enhanced budget of Rs. 2,750 crore, marking the launch of **AIM 2.0** to strengthen India's innovation ecosystem until 2028.

What is the AIM 2.0?









- **AIM 2.0:** Building on AIM success, such as **Atal Tinkering Labs (ATLs)** and **Atal Incubation Centers (AICs)**, AIM 2.0 seeks to scale and pilot new initiatives.
 - It aims to expand and deepen India's innovation and entrepreneurship ecosystem.
 - India ranks **39th on the Global Innovation Index** and is home to the world's **third-largest start-up ecosystem**.
- **Key Programs Under AIM 2.0:**
 - **Language Inclusive Program of Innovation (LIPI):** Establish vernacular innovation centers in **22 scheduled languages** to support non-English-speaking innovators.
 - **Frontier Program:** Create 2500 new ATLs in underserved regions like Jammu and Kashmir, North Eastern states, and Aspirational Districts.
 - **Programs Targeting Improving Ecosystem:** Trains professionals (managers, teachers, trainers) for the innovation ecosystem.
 - Create a research sandbox for commercialising deep tech startups requiring longer investment.
 - Strengthen state-level innovation ecosystems through **NITI Aayog's State Support Mission**.

- Expands India's innovation ecosystem globally through engagements with advanced nations, **Global Tinkering Olympiad**, and partnerships with **United Nations World Intellectual Property Organization (WIPO)** and **G20**.
- **Programs Targeting Improved Output Quality:** The **Industrial Accelerator Program** aims to scale up advanced startups by creating 10 accelerators in critical sectors through **Public-Private Partnerships (PPP)**.
- The **Atal Sectoral Innovation Launchpads (ASIL)** program will establish **10 iDEX-like platforms** across central ministries to integrate and procure from startups in key industry sectors.

Atal Innovation Mission

- **About:** Launched by NITI Aayog in 2016, AIM promotes innovation and entrepreneurship by fostering a problem-solving mindset in students and strengthening the entrepreneurial ecosystem in universities and research institutions.
- **Key Programs under AIM:**
 - **Atal Tinkering Labs (ATLs):** Set up in schools to foster innovation in students (grades 6-12) using tools like **3D printing**.
 - **Atal Incubation Centres (AICs):** Business incubators promoting startups with mentorship, funding, and technical support.
 - **Atal Community Innovation Centres (ACICs):** Focused on underserved regions, promoting innovation in Tier 2/3 cities, tribal areas, etc.
 - **Atal New India Challenges (ANIC):** Supports technology-based innovations addressing national challenges, providing funding and mentorship.
 - **Mentor India:** Engages 6,200+ mentors across sectors to guide entrepreneurs and innovators under AIM's programs.

Impact created

 10,000 Atal Tinkering Labs (ATL) 1.1 Crore + Students actively engaged in ATLs	 72 Atal Incubation Centres (AIC) 32000+ Jobs Created	 3500+ Startups Supported 1000+ Women Lead Startups	 6200+ Mentors of Change
 15 Applied Research and Innovation for Small Enterprises Challenges	 14 Atal Community Innovation Centres	 24 Atal New India Challenges	 40+ Domestic & International Partnerships

Note:

Comptroller and Auditor General of India

Why in News?

K Sanjay Murthy has been appointed as the **new Comptroller and Auditor General (CAG) of India**, succeeding **Girish Chandra Murmu**.

What are the Key Facts About the Comptroller and Auditor General?

- **About:** The CAG of India, as per **Article 148 of the Constitution**, heads the **Indian Audit and Accounts Department (IA-AD)**. He/she is responsible for safeguarding the public purse and overseeing the financial system at both the central and state levels.
 - The CAG upholds the **Constitution and parliamentary laws** in financial administration and is considered one of the key pillars of India's democratic system, alongside the **Supreme Court, Election Commission, and Union Public Service Commission**.
 - CAG of India is governed by the **Comptroller and Auditor-General's (Duties, Powers and Conditions of Service) Act, 1971**, with significant amendments in 1976, 1984, and 1987.
- **Appointment and Term:** The CAG of India is appointed by the **President of India** by a **warrant under his hand and seal**. The officeholder serves a **term of six years or until the age of 65**, whichever is earlier.
 - The CAG takes an **oath** to uphold the Constitution and perform duties impartially, without fear or favour.
 - CAG removal is possible by the **President** on the same grounds and process as a **Supreme Court judge**, requiring a special majority resolution in both Houses of Parliament for proven **misbehaviour or incapacity**.
 - CAG can resign any time from his office by addressing the resignation letter to the president.
- **Independence:** The CAG can only be removed by the President following a constitutional procedure, **not at the President's pleasure**.
 - The CAG is ineligible for any **further office** under the Government of India or any state after leaving office.
- The Parliament determines the CAG's salary, which is equal to that of a Supreme Court judge.
- **The President, in consultation with the CAG**, prescribes the service conditions for CAG's staff and administrative powers.
- The CAG's administrative expenses, including salaries, allowances, and pensions, are charged upon the **Consolidated Fund of India**, not subject to Parliamentary vote.
- No minister can represent the CAG in Parliament or take responsibility for his actions.
- **Duties and Powers:** The CAG audits the **accounts** related to the expenditure from the **Consolidated Fund of India** and state funds.
 - It also audits accounts of **government corporations**, public sector undertakings, and bodies substantially funded by the government.
 - The CAG provides a **certificate** on the net proceeds of taxes and duties, and audits transactions related to debt, advances, and suspense accounts.
 - The CAG submits **audit reports** to the **President**, who places them before Parliament. These reports are then examined by the **Public Accounts Committee**.
- **Role:** The CAG acts as an agent of **Parliament**, ensuring that public money is spent legally and efficiently.
 - Reviews whether money disbursed was legally available and applied correctly and whether expenditure conforms to the governing authority.
 - The CAG is responsible for **safeguarding the taxpayers' money** and ensuring that it is spent in accordance with the law and for its intended purposes.
 - In addition to legal and regulatory audits, the **CAG can conduct propriety audits**, that is, he can assess the **wisdom, faithfulness, and economy of government expenditure**, and comment on **wastefulness and extravagance**.
 - Unlike legal and regulatory audits, which are obligatory, propriety audits are discretionary.
 - The CAG in **India does not have control over the issuance of funds** and performs the **role of Auditor-General only**, unlike the **CAG in Britain**, which also functions as a Comptroller.

Note:

➤ **International Audits:**

- **IAEA (2022-2027):** CAG is the External Auditor for the **International Atomic Energy Agency**, promoting the safe use of nuclear technologies.
- **FAO (2020-2025):** CAG audits the **Food and Agriculture Organization**, working towards global food security.

Constitutional Provisions Regarding CAG of India

Provision	Description
Article 148	Deals with the appointment, oath, and conditions of service of the CAG of India.
Article 149	Specifies the duties and powers of the CAG of India.
Article 150	States that the accounts of the Union and States must be kept in a form prescribed by the President on the advice of the CAG.
Article 151	Requires the CAG's reports on Union accounts to be submitted to the President and laid before Parliament; state reports to be submitted to the Governor and laid before the State Legislature.
Article 279	Provides that the CAG certifies the calculation of "net proceeds" and its certificate is final.
Third Schedule	Section IV prescribes the oath or affirmation to be made by the Judges of the Supreme Court and the CAG upon assuming office.
Sixth Schedule	Specifies that accounts of District or Regional Councils should be kept in a form prescribed by the CAG and audited accordingly. Reports are to be submitted to the Governor for laying before the Council.

How Does the CAG Strengthen Democracy?

- **Ensuring Accountability:** Key principles of **India's democratic framework** are **accountability, citizen**

engagement, and decentralization. As governance becomes more complex, these principles must be upheld through robust mechanisms.

- The CAG of India ensures government accountability in public fund usage, **preventing misuse of taxpayer money** and promoting **governance in citizens' best interests**, which is essential in a **democracy**.
- **Strengthening Local Governance:** CAG supports **Panchayati Raj Institutions (PRIs)** and **urban local bodies** through capacity building and guidance.
 - Through **Annual Technical Inspection Reports (ATIR)**, it assesses local government performance in service delivery. To address the shortage of skilled accountants, the CAG, in collaboration with the **Institute of Chartered Accountants of India (ICAI)**, offers online courses.
- **Safeguarding Separation of Powers:** Audits ensure the executive's financial activities align with legislative intent, maintaining a **balance of power**.
- **Citizen-Centric Approach:** By placing citizens at the heart of audit processes, the CAG ensures that the implementation of government programs reflects the aspirations of the people.
 - Citizen feedback helps the CAG identify high-risk areas where mismanagement may occur, improving the focus and effectiveness of audits.

What Major Scandals Has the CAG Uncovered?

- The CAG has been instrumental in exposing several high-profile cases of corruption and financial irregularities.
 - **2G Spectrum Allocation Scam:** CAG highlighted a loss of Rs 1.76 lakh crore.
 - A report by the CAG of India revealed that the Indian government **allocated 2G spectrum licenses** at **significantly undervalued prices**, bypassing free and fair auctions.
 - **Coal Mine Allocation Scam:** CAG estimated wrongful gains of Rs 1.85 lakh crore.

Note:

- The **Coal Scam**, popularly known as **Coalgate**, refers to the irregular and **potentially illegal allocation of coal blocks** from 2004 to 2009, bypassing competitive bidding despite the government's authority to do so.
- **Fodder Scam**: CAG uncovered fraudulent withdrawals worth Rs 940 crore.
 - The **Fodder Scam**, or **Chaara Ghotala**, involved financial irregularities in Bihar's Animal Husbandry Department between 1985 and 1995.

What are the Criticisms Regarding the Functioning of the CAG in India?

- **Declining Number of Reports Tabled**: The number of audit reports tabled by the CAG in Parliament has declined significantly, from 53 in 2015 to just 18 in 2023, raises concerns about **reduced oversight and transparency in government spending**, potentially hindering the identification of financial irregularities.
 - Additionally, the CAG audits many companies and government bodies directly, but evaluates only a few each year, leaving many audits pending.
- **Post-Facto Audits**: The CAG's auditing function is largely post-facto, meaning that audits occur after government expenditures have been made, **rather than being involved in decision-making processes upfront**.
 - This approach limits the CAG's ability to prevent financial mismanagement or irregularities before they occur.
 - Essentially, the CAG performs a postmortem of financial transactions. While post-facto audits are useful for identifying issues, they **do not contribute to proactive financial oversight**.
- **Limited Importance of the CAG's Function**: Auditors **focus on auditing, not administration**, making their function necessary but limited in perspective and usefulness. Additionally, CAG does not have a **role in pre-auditing** before the issuance of the budget.

- **Insufficient Economic Expertise**: Critics argue that the CAG lacks sufficient economic expertise, especially when auditing complex sectors like **natural resources**.
 - The Indian Audit and Accounts Department (IA&AD) has seen a significant decline in staffing, from 48,253 in 2013-14 to 41,675 in 2021-22. This reduction may affect the **CAG's ability to conduct thorough audits**, potentially leading to gaps in scrutiny and hindering transparency and accountability.
- **Delay in Reporting**: There are often delays in the submission of documents to the CAG and in the tabling of CAG reports in Parliament, which can hinder timely accountability.

What Reforms are Needed for CAG?

- **Amendments to the CAG Act**: The CAG Act of 1971 should be amended to reflect modern governance needs and improve accountability.
- **Selection Process**: Establish a **collegium** comprising the **President, Chief Justice of India, Prime minister, and Leader of Opposition** for appointing the CAG.
 - This approach ensures a more impartial and legitimate selection process, promoting fairness and transparency.
- **Adaptation to New Challenges**: The CAG needs to adapt to auditing **new areas such as climate change and critical technologies**. This adaptation is crucial for ensuring comprehensive oversight and accountability in these **emerging sectors**.
- **Capacity Building**: Enhance the training and capacity of CAG staff, especially in specialised areas like natural resources, technology, and complex economic sectors, to improve the quality of audits.
- **Feedback Mechanism**: Establish a robust feedback mechanism to address the concerns and suggestions of audited entities, ensuring that audits are constructive and lead to improvements.

Note:





COMPTROLLER & AUDITOR GENERAL OF INDIA (CAG)

Appointment & Term

Article 148:

- ⌚ **Appointed By:** The President of India
- ⌚ **Tenure:** 6 years or until 65 years of age (whichever is earlier)
- ⌚ **Removal Process:**
 - ⚡ Same as a SC judge
 - ⚡ Requires special majority in Parliament for proven misbehavior or incapacity
- ⌚ **Oath:** To uphold the Constitution, sovereignty, and integrity of India

Independence

Article 148:

- ⌚ Secured tenure; not removable at the President's discretion
- ⌚ Post-tenure ineligibility for government office
- ⌚ Salary & office expenses charged to the **Consolidated Fund of India** (not subject to Parliamentary vote)
 - ⚡ No minister can represent the CAG in Parliament or be held responsible for its actions

Article 149: Service conditions prescribed by Parliament; cannot be altered to CAG's disadvantage post-appointment

Duties & Powers

Article 149: Prescribes CAG's duties & powers

Audits:

- ⚡ Consolidated Fund, Contingency Fund, & Public Account of India & States
- ⚡ Government bodies, corporations, & authorities financed by public revenue

⌚ **Article 150:** Advises the President on the format of Union & State accounts

⌚ **Article 279:** Certifies **net proceeds** of taxes & duties

Article 151: Submits 3 audit reports annually to:

- ⌚ **President** – Audit on appropriation, finance accounts, and public undertakings
- ⌚ **Governor**– Reports on State accounts for State Legislatures

Role

- ⌚ **Acts as Parliament's Agent:** Ensures public funds are used legally and efficiently
- ⌚ **Public Accounts Committee (PAC):** Functions as its advisor
- ⌚ Ensures transparency, accountability, and adherence to financial laws
- ⌚ Unlike its British counterpart, serves as an **Auditor-General**, not a Comptroller

Related Issues

- ⌚ **Delays in Audit Reports:** Reduces oversight and transparency
- ⌚ **Focus on Post-Facto Audits:** Limits proactive control
- ⌚ **Resource Challenges:** Lack of economic expertise and staffing
- ⌚ **Limited Pre-Budget Role:** Does not engage in decision-making

*K Sanjay Murthy
Assumed Office
as the CAG in
November
2024*

Recommendations for Reforming the Office of CAG (Given by Vinod Rai- Former CAG)

- ⚡ Expanding the CAG's mandate to cover **PPPs, Panchayati Raj Institutions, & government-funded societies**
- ⚡ Amend the **CAG Act of 1971** to align with modern governance
- ⚡ Create a **collegium system** for selecting a new CAG



Note:



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Conduct Rules for Civil Servants

Why in News?

Recently, Kerala has suspended two IAS officers citing violation of **All-India Services (Conduct) Rules, 1968 (AIS rules)**.

- An IAS officer made **derogatory social media remarks** about a senior colleague, while another was suspended for allegedly forming a **religion-based WhatsApp group**.

What do the All-India Services (Conduct) Rules, 1968 State?

- **About:** AIS rules, 1968 outline **ethical and professional standards** aimed at ensuring **impartiality, integrity, and adherence to constitutional values** in the conduct of IAS, IPS, and Indian Forest Service officers.
- **Standards Outlined:** The key standards outlined are summarised as follows.
 - **Ethical Standards:** Officers must exhibit **high levels of ethics, integrity, and honesty**. They are also expected to remain **politically neutral, accountable, and transparent** in their actions and decisions.
 - **Supremacy of Constitutional Values:** Officers must uphold **constitutional values**, reflecting their duty as public servants committed to the **nation's legal framework**.
 - **Engagement in Public Media:** Officers may engage in **public media in a bona fide professional capacity**. However, they are prohibited from using such platforms to criticise government policies.
 - **Legal and Media Appeals:** Officers are **not** permitted to seek **redress or defend official acts** subject to criticism through the court or media without prior government approval.
 - **General Conduct Clause:** Officers must refrain from any behaviour deemed **"unbecoming of their service"**. This broad rule ensures that officers maintain a high standard of decorum and professionalism at all times.

What are the Issues with AIS Rules, 1968?

- **Lack of Explicit Social Media Guidelines:** The existing rules **do not** specifically address officers' communication and conduct on **social media platforms**.
 - The growth of digital engagement has created **ambiguity**, making it **hard to set boundaries** and enforce proper behaviour.
- **Unbecoming Conduct Clause:** The term **"unbecoming of a member of the service"** remains a **broad, undefined clause** which leads to inconsistent enforcement and creating potential for abuse.
- **Power Imbalance in Enforcement:** The enforcement of these rules often rests with **senior officers and government authorities**. Junior officers may be **vulnerable to misuse** of rules by superiors, requiring protections against bias and arbitrary actions.

What is the Role of Civil Services in Democracy?

- **Policy Formulation:** Civil servants provide **technical expertise** and practical insights that help in formulation and determination of public policy.
- **Implementation of Policies:** Civil servants are responsible for the **execution of policies passed** by the legislature. This involves overseeing the practical application of laws and policies.
- **Delegated Legislation:** Civil servants are often tasked with framing **detailed rules and regulations** under delegated legislation. The legislature sets the framework, while civil servants define the specifics vital for daily government operations.
- **Administrative Adjudication:** Civil servants also hold **quasi-judicial powers** and are responsible for resolving cases that involve the rights and obligations of citizens.
 - It ensures **quick, fair decisions** in the public interest, especially for **vulnerable groups or technical issues**, facilitating timely dispute resolution.
- **Stability and Continuity:** Civil servants maintain **stability and continuity** in governance during **election-driven political changes**, ensuring smooth policy and administrative processes despite shifts in leadership.
- **Guardians of National Ideals:** Civil servants act as **custodians of the nation's ideals, values, and beliefs**. They play an important role in safeguarding the social, economic, and political fabric of the nation.

Note:



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FOUNDATIONAL VALUES FOR CIVIL SERVICES

The foundational values for civil services represent the fundamental principles and ethics that guide the conduct and responsibilities of civil servants.



Integrity

- ↳ Integrity refers to the soundness of moral principles, uncorrupted character, uprightness, honesty and sincerity.
- ↳ **Types:**
 - ↳ Moral Integrity
 - ↳ Intellectual Integrity
 - ↳ Professional Integrity
- ↳ **Example:** Satyendra Dubey (IES officer) – one of the first whistleblowers of India – exposed corruption in the Golden Quadrilateral Highway Construction Project.

Impartiality

- ↳ The quality of being fair, or not being biased or partial towards anything or anyone and acting solely according to the merits of the case.
- ↳ **Example:** An officer should distribute funds based on the needs of the communities rather than showing bias towards their own interests.

Non-Partisanship

- ↳ Non-disposition towards any political party, i.e., to exhibit political neutrality.
- ↳ **Example:** T.N. Seshan, as Chief Election Commissioner (CEC) from 1990–96, brought changes to ensure non-partisanship in the election process.

Objectivity

- ↳ Following facts rather than personal opinions to achieve equality.
- ↳ **Example:** When designing social welfare programs, the focus should be on the needs of the underprivileged populations, rather than favouring the wealthy/politically influential groups.

Tolerance

- ↳ Respect, acceptance and appreciation of the opinions, practices, race, religion etc. different from one's own.
- ↳ **Example:** Ashoka's Dhamma (religious tolerance and discouraged religious persecution)

Dedication to Public Service

- ↳ Being committed, responsive, and putting the public interest first.
- ↳ **Example:** Ashok Khemka (IAS officer) known for his stance against corruption.

Nolan Principles of Public Life

- ↳ First set out by **Lord Nolan** in a report on Committee on Standards in Public Life in the UK (1995)
- ↳ Outline the ethical standards those working in the public sector
- ↳ **Principles:**
 - Selflessness ▪ Integrity ▪ Objectivity ▪ Accountability ▪ Openness ▪ Honesty ▪ Leadership



Note:

Article 311

- **Article 311 (1):** It ensures that **no** government employee can be **dismissed, removed, or reduced** in rank by an authority subordinate to the one that appointed them.
- **Article 311 (2):** A civil servant cannot be dismissed or removed unless an **inquiry** has been **conducted** where they are informed of the charges and given a reasonable opportunity to defend themselves.
- **Exceptions to Inquiry Requirement (Article 311 (2)):** An inquiry is not required in the following circumstances:
 - **Criminal Conviction:** If the civil servant is dismissed or removed based on conduct leading to a **criminal conviction (Clause 2(a))**.
 - **Practical Impossibility:** If the authority is satisfied, in writing, that holding an inquiry is **not practically possible (Clause 2(b))**.
 - **National Security:** If the President or Governor determines that an inquiry is **not expedient** for reasons of national security **(Clause 2(c))**.

State Finance Commission

Why in News?

According to the **Ministry of Panchayati Raj**, all states, except Arunachal Pradesh have constituted **State Finance Commissions (SFCs)**.

- The **15th Finance Commission**, in its report, expressed significant concern over delays in constituting SFCs.

What are the Key Points about State Finance Commissions (SFCs)?

- **About:** SFCs are **constitutional bodies** established by states under **Article 243-I** of the Indian Constitution.
 - As per **Article 243-I**, the **Governor** is required to constitute an SFC within one year from the enactment of the **73rd Constitutional Amendment Act, 1992** and **every five years thereafter**.
- **Mandate:** Their primary role is to recommend the **distribution** of financial resources between the **state government and its local bodies** i.e., **Panchayati Raj Institutions (PRIs)** and **urban local bodies (ULBs)**.

- **15th Finance Commission on SFCs:** The 15th Finance Commission recommended states establish SFCs, implement their recommendations, and submit an **action report** to the legislature.
 - It suggested **withholding grants for states** that do not comply with these requirements.
- **Role of Ministry of Panchayati Raj:** It is tasked with **certifying compliance by states** with constitutional provisions for SFCs before the release of grants for **2024-25 and 2025-26**.

Why Appointment of State Finance Commissions (SFCs) is Important?

- **Constitutional Requirement:** Regular and timely constitution of SFCs every five years under Article 243(I) is a **constitutional mandate** aimed at ensuring **financial health and autonomy** of local bodies.
- **Fiscal Devolution:** The distribution of state revenues among **local tiers** ensures a **fair allocation of funds**, balancing the financial strength of local bodies.
 - This role complements the Union **Finance Commission's** allocation of central funds to states and local bodies.
- **Enhancing Accountability:** By **evaluating** financial needs, suggesting **optimal utilisation** of resources, and recommending **fiscal measures**, SFCs can drive local governments to improve **service delivery** and **become more responsive** to citizens' needs.
 - SFCs provide mechanisms for **performance-based evaluation**, which could lead to a system of **rewards and penalties**, fostering better governance practices at the local level.
- **Addressing Local Needs Directly:** Local governance bodies **impact daily life** by providing services like **sanitation, health, education, and infrastructure**.
 - Proper funding and financial autonomy, supported by SFC recommendations, are key to improving service quality.
- **Bridging the Functional and Financial Gap:** Local bodies often face **unfunded mandates** due to a lack of financial resources.
 - SFCs address this by recommending **financial devolution** based on responsibilities, ensuring local governments have the resources to **meet their obligations**.

Note:



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- SFCs can **streamline fiscal transfers**, improve funding predictability, and reduce volatility with effective recommendations.
- **Political and Administrative Decentralisation:** The role of SFCs extends **beyond fiscal recommendations**. It serves to empower **local elected representatives** like **municipal councillors** and **panchayat pradhans**.

Finance Commission

- **Constitutional Basis:** It is a constitutional body established under **Article 280** of the Indian Constitution.
 - It is appointed by the **President** every **five years** or at an earlier time deemed necessary by the President.
- **Composition:** The Commission consists of a **Chairman** and **four other members** appointed by the President.
 - The **chairman** should be a person having **experience in public affairs**.
- **Functions and Duties:** The primary function of the Finance Commission is to make **recommendations to the President** on various financial matters.
 - **Tax Distribution:** It recommends the distribution between the **Union and States** of the net proceeds of taxes that are to be divided between them.
 - **Grants-in-Aid:** It suggests the principles for grants-in-aid from the **Consolidated Fund of India** to the States.
 - **Augmentation of State Funds:** It recommends measures to **augment the Consolidated Fund of a State** to supplement the resources of **Panchayats** and **Municipalities** based on the recommendations of the State's Finance Commission.
 - **Additional Matters:** The Finance Commission may also address any other matter referred to it by the President in the interest of sound public finance.
- **Significance for Local Governance:** The Finance Commission not only determines the financial relationship between the **Union and States** but also recommends ways to strengthen **local bodies' fiscal capacities**.

- This ensures that local governments have **sufficient funds** to provide essential services, contributing to **decentralised governance** and **people-centric policies**.

- **16th Finance Commission:** The **16th Finance Commission** was constituted in **December 2023** with **Arvind Panagariya** as its Chairman.
 - It covers an award period of **5 years commencing 1st April, 2026**.

What are the Problems with State Finance Commissions (SFCs)?

- **Compliance Issues:** The **15th Finance Commission (2021-26)** highlighted that **only nine states** have constituted their **6th SFC**, even though it was due in **2019-20** for all states.
 - **Many states** remain stuck at the **2nd or 3rd SFC**, indicating a lack of timely renewal and updates.
- **Lack of Political Will:** There is **widespread resistance** among state governments to **fully devolve power** and resources to local bodies, as intended by the **73rd and 74th constitutional amendments**.
- **Resource Deficiencies:** SFCs often need to **start from scratch** when collecting data due to a **lack of readily available and organised information**, further hampering their effectiveness.
- **Deficiencies in Expertise:** Many SFCs are led by **bureaucrats or politicians**, lacking domain experts and public finance professionals.
 - The absence of **qualified technocrats** diminishes the **credibility and quality of SFC recommendations**, which weakens their impact.
- **Opacity:** States often fail to table **Action Taken Reports (ATRs)** in the legislature after SFC recommendations, reducing transparency and accountability.
- **Ignorance of SFC Recommendations:** There is a pattern of **non-compliance with SFC recommendations** by state governments, which undermines the role of SFCs in shaping fiscal policies for local governance.
- **Peoples' Resistance:** Experts note that urban local bodies **face neglect, with low political awareness and limited public engagement**, which worsens the state of fiscal decentralisation.

Note:



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Finance Commission

The Finance Commission is the balancing wheel of fiscal federalism in India

~ Indian Constitution

Article 280 (Indian Constitution Part XII)

Constitution of FC as a Quasi Judicial Body

Constituted by

President of India
quinquennially (or earlier)

Members

- Chairman + 4 members (including an HC judge) – appointed by President
- Authority to decide qualifications – Parliament
- Tenure – as specified by the President
- Reappointment – Eligible

Makes Recommendations to President about

- Distribution of **net tax proceeds** between Centre and States
- Principles for **grants-in-aid** to the states by the Centre
- Evaluates the rise in the **Consolidated Fund of a state** to affix the resources of Panchayats/Municipalities
- Other **financial matters** referred to it by President

Powers of a Civil Court

As per Code of Civil Procedure 1908

*Recommendations of the FC are **only advisory and not binding** on the Government

First FC (1952–57)

Chairman - KC Neogy

Second FC (1957–62)

Chairman - K Santhanam

Current/Fifteenth FC (2021–2026)

Chairman - NK Singh

State Finance Commission

- Constituted by **Governor** every 5th year (Article 243)
- Reviews the financial position of **Panchayats and Municipalities**



Note:

Reforming Khap Panchayat

Why in News?

Khap Panchayats are sometimes seen in the news for multiple reasons, with some leaders advocating for progressive reforms to address key social and economic issues, including **unemployment, education, and rural development**.

- Efforts are also being made to **modernise and regulate** Khap Panchayats, integrating them into **formal Alternative Dispute Resolution (ADR) systems** for better governance and accountability.

What is Khap Panchayat?

- **About:** Khap Panchayats are **traditional community-based councils** primarily in **North India**, especially in **Haryana and Uttar Pradesh**, that function as informal judicial bodies.
 - Originating centuries ago, they were formed among kinship groups (Khaps) to address social and governance issues within their communities.
- **Historical Role:** The system played a significant role in maintaining **social order** in rural societies, acting as a forum for **conflict resolution** within caste hierarchies, and operating parallel to formal legal systems while prioritising **customary norms**.
- **Issues with Khap Panchayats:**
 - **Patriarchal Practices:** They are often associated with **gender inequality**, enforcing rigid social norms that restrict women's autonomy.
 - **Honor Killings:** Infamous for opposing **inter-caste and same-gotra marriages**, sometimes sanctioning extreme measures like honour killings.
 - **Legality Concerns:** Their decisions frequently violate **constitutional rights**, clashing with the principles of **personal liberty, equality, and dignity**.
 - **Caste and Social Inequities:** Their focus on **maintaining caste hierarchies** reinforces discrimination and exclusion.
- **Gender Dynamics and Evolving Roles of Khap Panchayats:**
 - **Support for Women Athletes:** Khaps have **felicitated successful women sportspersons**, contributing to a growing culture of sports among women.

- **Gender Justice:** Supported the **2023 wrestlers' protest against sexual harassment**, marking a shift towards gender-related activism.
 - For instance, **Meham Chaubisi**, one of Haryana's most influential **Khaps**, is playing a growing role in **promoting justice, social change, and addressing women's issues**.

Supreme Court Ruling Related to Khap Panchayat

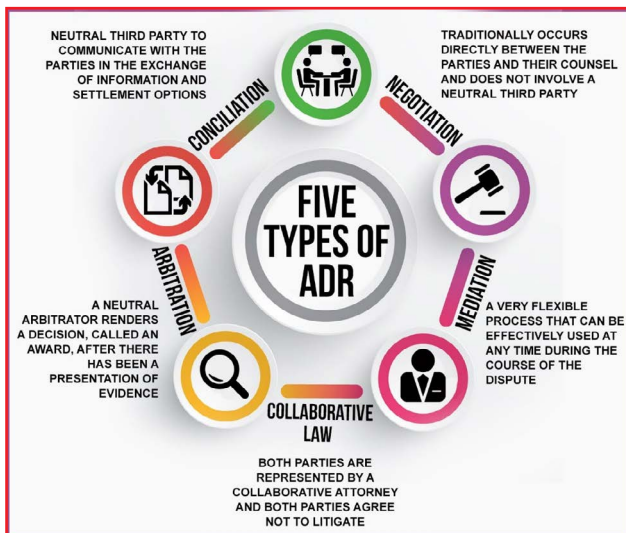
- The **Shakti Vahini v. Union of India case, 2018**, was a landmark judgment by the **Supreme Court of India** that addressed the issue of **honour killings and inter-caste marriages**.
 - The Court ruled that **honor killings** are a violation of **fundamental rights** and emphasized the need for strict action against such crimes.
 - It directed the **State Governments** to take proactive measures to prevent honor killings, including setting up special cells and providing protection to couples facing threats from their families.

What is Alternative Dispute Resolution (ADR) Mechanism?

- **About:**
 - **ADR** is a **non-adversarial** method of dispute resolution that encourages **cooperative** efforts to reach mutually beneficial outcomes.
 - It helps reduce court burdens and provides a **satisfying experience** for involved parties.
 - ADR enables **creative bargaining**, fulfilling underlying interests and expanding solutions.
- **Need for ADR:**
 - India's judicial system faces immense stress due to increasing **case pendency** and delays, highlighting the need for **ADR methods**.
 - ADR ensures **confidentiality**, is **cost-effective**, and offers **flexibility**, often leading to **creative solutions and improved relationships**.
- **Types of ADR Mechanisms:**
 - **Arbitration:** Disputes are resolved by an **arbitral tribunal** whose decision is **binding** and offers limited judicial intervention.

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- **Conciliation:** A third party helps the disputing parties reach a **mutually satisfactory settlement**, with the option to accept or reject recommendations.
- **Mediation:** A **mediator** helps the parties communicate and settle disputes **amicably**, leaving control with the parties.
- **Negotiation:** A **non-binding** method where parties negotiate directly to resolve disputes without third-party involvement.
- **Status of ADR in India:**
 - **Statutory Backing:** **Legal Services Authorities Act (1987)** and **Arbitration and Conciliation Act (1996)** promote out-of-court settlements.
 - **Plea-Bargaining:** Introduced in the **Code of Criminal Procedure (Amendment) Act, 2005** (now **Bharatiya Nagarik Suraksha Sanhita**) for pre-trial negotiations.
 - **Lok Adalats:** Informal **people's courts** that resolve disputes without legal technicalities.
 - **Recent Developments:** The **Arbitration and Conciliation (Amendment) Bill (2021)** addresses misuse, and the **Mediation Bill (2021)** recommends changes.



What Can Be Done to Make Khap Panchayat a Part of Formal ADR?

- **Promote Alternative Dispute Resolution (ADR):** Integrating **Khap Panchayats** into the formal **ADR system** by legalising their mediatory roles within a framework aligned with **constitutional principles**.
 - Offer training to Khap leaders on **mediation** and **arbitration techniques** to enhance their capability for impartial dispute resolution.
- **Legal Regulation:** Formulate laws to define the **scope and limitations** of Khap Panchayat activities, ensuring decisions align with **Indian laws** and **human rights**.
 - Set up **oversight mechanisms** to monitor their actions, preventing unconstitutional practices like honour killings or forced marriage annulments.
- **Shift Focus to Development:** Some Khap leaders advocate for progressive stances, addressing **social and economic challenges** like **unemployment, education, and rural development**.
 - Efforts are underway to modernise or regulate **Khap Panchayats**, including integrating them into formal dispute resolution systems.
- **Awareness and Accountability:** Create **public awareness campaigns** to educate communities on the importance of **constitutional rights** and the legal system.
 - Hold Khap Panchayats **accountable** for actions that undermine justice or equality.
- **Collaboration with Formal Institutions:** Facilitate partnerships between Khap Panchayats and local governance bodies to create **inclusive decision-making structures**.
 - Involve **judiciary representatives** to ensure their decisions are legally sound.

Note:

Economic Scenario

Highlights

- Insurance Sector in India
- Basic Animal Husbandry Statistics 2024
- State of the Rural Economy of India
- India Signs MoU on Critical Minerals Cooperation
- Coking Coal as Critical Mineral
- Access to Medicine Index Report 2024
- Rethinking New Population Strategy
- India's Trade Deficit as an Opportunity
- Rising Inflation in India
- Developments in India's Maritime Sector
- India's Transition Towards Workforce Formalisation
- CSR for Agriculture Sustainability
- Assessing the Potential of Natural Farming
- Domestic Systemically Important Banks (D-SIBs)
- Dhudmaras Village

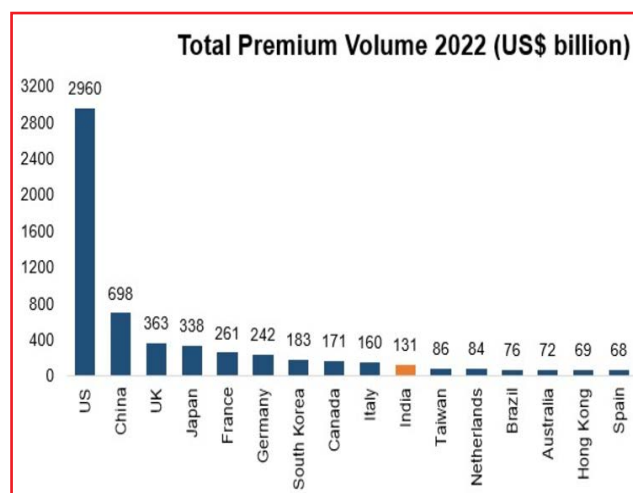
Insurance Sector in India

Why in News?

Recently, the heads of several **general insurance companies** in India **convened** to discuss the **challenges** facing the insurance sector in the country and shared their **insights on the future trajectory** of the industry.

What is the Current State of Insurance Sector in India?

- **Global Market Position:** India ranks as the **10th largest insurance market** worldwide and holds the **2nd largest position** among emerging markets, with an estimated **market share of 1.9%**.



- **Potential:** As per the **Insurance Regulatory and Development Authority of India (IRDAI)**, India will be the **6th largest** insurance market within a decade, leapfrogging **Germany, Canada, Italy and South Korea**.
 - The insurance market in India is expected to reach **USD 222 billion by 2026**.
- **Insurance density:** It has increased from **USD 11.1 in 2001** to **USD 92 in 2022**.
 - The breakdown includes a life insurance density of **USD 70** and a non-life insurance density of **USD 22**.
 - Insurance density measures the **average insurance premium per person**.
- **Insurance penetration:** It has steadily risen from **2.7% in 2000** to **4% in 2022**.
 - Insurance penetration is defined as **premiums as a percentage of GDP**.
- **Foreign Direct Investment (FDI):** Between 2014-23, the insurance sector has received nearly **Rs. 54,000 crore (USD 6.5 billion)** in **FDI**.
 - Currently, **74% FDI** is allowed in the insurance sector.
- **Market Composition:** **Life Insurance Corporation of India (LIC)** remains the sole **public sector life insurer**, holding **62.58% market share** in new business premiums for FY23.
 - The **private sector's market share** in general and health insurance rose from **48.03% in FY20** to **62.5% in FY23**.

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What are the Challenges in India's Insurance Sector?

- **Low Insurance Penetration:** Insurance penetration in India **remains low** compared to global standards.
 - India's insurance penetration was **4% in 2022** compared to **6.5% globally**.
- **Affordability Concerns:** The perception of **high costs**, especially with **GST rates at 18%**, continues to **deter potential buyers**.
- **Distribution Inefficiencies:** Reaching **underserved regions and demographics**, particularly rural and semi-urban areas, remains challenging.
 - Rural areas are home to **65% of India's population**, **over 90 crore people**, yet **only 8%-10%** have life insurance coverage.
- **Lack of Customisation:** The **lack of customisation** options that align with their specific requirements makes health insurance **less attractive to potential policyholders**.
- **Fraud and Risk Evaluation Challenges:** **Fraudulent claims and inefficient risk evaluation** increase costs, causing leakages that diminish overall savings in the insurance ecosystem.
- **Digital Transformation Hurdles:** Digitizing insurance processes increases **cybersecurity risks**, making the sector a **target for malicious actors** seeking sensitive customer data.
- **Limited Financial Literacy:** The general public's **low financial literacy** hampers the ability to make informed decisions regarding insurance products.
 - In India, **1 in 5 health insurance** policy owners are **unaware of basic policy terms** despite purchasing the policy on their own.

What is IRDAI?

- IRDAI, founded in **1999**, is a **regulatory body** created with the aim of protecting the interests of insurance customers.
 - It is a **statutory body** under the **IRDAI Act, 1999** and is under the jurisdiction of the **Ministry of Finance**.
- It regulates and sees to the development of the insurance industry while **monitoring insurance-related activities**.
- The powers and functions of the Authority are laid down in the **IRDAI Act, 1999 and Insurance Act, 1938**.

Insurance for All by 2047

- **About:** IRDAI aims to achieve '**Insurance for All**' by **2047**, ensuring that every citizen has comprehensive **life, health, and property insurance coverage**, and enterprises are supported with appropriate insurance solutions.
- **3 Pillars:** Insurance **customers (Policyholders)**, Insurance **providers (insurers)** and Insurance **distributors (intermediaries)**
- **Focus Areas:**
 - Making available **right products** to right customers
 - Creating robust **grievance redressal** mechanism
 - Facilitating **ease of doing business** in the insurance sector
 - Ensuring the **regulatory architecture** is aligned with the **market dynamics**
 - Boosting **innovation**
 - **Competition and distribution efficiencies** while mainstreaming technology and moving towards principle based regulatory regime.

What are Government Initiatives to Increase Insurance Coverage?

- **Pradhan Mantri Jeevan Jyoti Yojana (PMJJBY)**
- **Pradhan Mantri Suraksha Bima Yojana (PMSBY)**
- **Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)**
- **Pradhan Mantri Fasal Bima Yojana (PMFBY)**

Basic Animal Husbandry Statistics 2024

Why in News?

Recently, the **Ministry of Fisheries, Animal Husbandry & Dairying** released the **Basic Animal Husbandry Statistics 2024 (BAHS)** on the occasion of **National Milk Day** (26th November).

- It is based on the outcomes of the **Integrated Sample Survey (ISS)** (March 2023–February 2024) and shows trends in major livestock products like **milk, eggs, meat, and wool**.
 - ISS is an annual, large-scale survey conducted by the Department of Animal Husbandry and Dairying.

Note:



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- It covers 15% of the villages across the country and estimates livestock numbers and production data for major products, including milk, meat, wool, and eggs.

Note: National Milk Day is celebrated on the birth anniversary of **Verghese Kurien** who made India self-sufficient in milk output through the **white revolution**.

What are Key Highlights of the BAHS 2024?

- **Milk Production:** India's total **milk production** for 2023-24 is estimated at **239.30 million tonnes**, reflecting a **3.78% increase** over 2022-23.
 - India is the **largest** producer of **milk** in the **world**. **Top 3** producers are **Uttar Pradesh**, **Rajasthan** and **Madhya Pradesh**.
 - Per Capita Milk Availability increased to **471 grams per day** in 2023-24 from **459 grams per day** in 2022-23.
- **Egg Production:** Total **egg production** for 2023-24 is estimated at **142.77 billion numbers**, a **3.18% increase** from 2022-23.
 - India ranked **2nd** globally in **egg production**. **Top 3** producers are **Andhra Pradesh**, **Tamil Nadu**, and **Telangana**.
- **Meat Production:** India's total **meat production** for 2023-24 is estimated at **10.25 million tonnes**, reflecting a **4.95% growth** over 2022-23.
 - **Top 3** producers are **West Bengal**, **Uttar Pradesh**, and **Maharashtra**.
- **Wool Production:** India's total **wool production** for 2023-24 is estimated at **33.69 million kg**, showing a **0.22% increase** from the previous year.
 - **Top 3** producers are **Rajasthan**, **Jammu & Kashmir**, and **Gujarat**.
- **Livestock Growth:** From 2014-15 to 2022-23, the sector grew at a **compound annual growth rate (CAGR) of 7.38%** (at constant prices).
 - The **share of livestock in agriculture Gross Value Added (GVA)** increased from **24.32% (2014-15)** to **30.38% (2022-23)**.
 - Currently, the **21st Livestock Census** is underway to provide updated data on cattle populations.

21st Livestock Census

- **About:** The **21st Livestock Census** was recently launched by the **Ministry of Fisheries, Animal Husbandry and Dairying**.
 - The census is carried out **every five years** to gather data on the number of **domesticated animals, poultry, and stray animals** across the country.
 - A total of **20 livestock censuses** have been conducted since **1919**. The **20th Census** was conducted in **2019**.
- **Data Collection:** The data will include information about the **species, breed, age, sex, and ownership status** of animals.
- **Animals Included in the Census:**
 - **Animals:** The census will cover **16 animal species**, including **Cattle, buffalo, mithun, yak, sheep, goat, pig, camel, horse, ponies, mule, donkey, dog, rabbit, and elephant**.
 - **219 indigenous breeds** recognised by the **ICAR-National Bureau of Animal Genetic Resources (NBAGR)** will be included.
 - **Poultry Birds:** The census will also count **poultry birds**, including **Fowl, chicken, duck, turkey, geese, quail, ostrich, and emu**.

State of the Rural Economy of India

Why in News?

India's rural economy faces significant challenges, including **poverty, unemployment**, and **agrarian distress**. To address these issues, there is a need to focus on rural industrialisation, particularly through women-owned **non-agricultural enterprises**.

- Expanding such enterprises can enhance **GDP** growth and improve employment opportunities in rural areas, especially for women.

What is the State of India's Rural Economy?

- **Rural Demographics:**
 - According to **Census 2011**, **68.85%** of India's population resides in **rural areas** and it is projected by **NITI Aayog** that it **will remain above 50% even**

Note:

in 2045, indicating the sustained significance of rural India in the nation's socio-economic fabric.

➤ **Living Conditions:**

- According to Census 2011, around **39% of rural households** resided in **one-room accommodations**, with only **53.2% having access to electricity** compared to **92.7% in urban** areas.
- **Traditional fuels** like firewood were used for cooking by **86% of rural households**, and **only 30.8% had access to tap water**, highlighting challenges in basic infrastructure and amenities.

➤ **Rural Poverty:**

- The **Tendulkar methodology** shows rural poverty was alarmingly high at **41.8% in 2004–05**, declining to around **25% in 2011–12**.
 - However, 6 states still had poverty ratios exceeding 35% in 2011–12.
- The rural **Monthly Per Capita Consumption Expenditure (MPCE)** remains significantly lower than urban levels, indicating **limited consumption capacity** and **acute poverty**.

➤ **Employment:**

- The **PLFS Report 2023-24** highlights that rural employment is largely characterised by **self-employment (53.5%)** and **casual labour (25.6%)**.
 - A significant portion of **rural workers (58.4%)** is **engaged in agriculture** (offers **seasonal employment**).
 - **Salaried jobs** in rural areas comprise only **12%** of the workforce, with most of these positions lacking contracts, paid leave, and job security.
- The **India Employment Report 2024** by the **ILO** shows unemployment among educated youth has nearly doubled from **35.2% in 2000 to 65.7% in 2022**, with women (76.7%) facing higher unemployment than men (62.2%).
- From 2017–18 to 2023–24, India added **150 million jobs**, with **rural women** driving **54%** of this growth, particularly in **agriculture**.
 - **Rural female workforce participation** increased by 12.5% to **34.8%** in 2023–24.

➤ **Agricultural Distress:**

- **Small and marginal farmers**, who constitute **86%** of the farming population, hold only **43%** of agricultural

land, while larger farmers with economic holdings manage 53% of the land.

- **Agricultural labourers** who make up a larger proportion of the rural workforce compared to landowners face **seasonal work**, **low wages**, and a **lack of social security measures**, including medical assistance and pensions.

What Steps Have Been Taken to Promote Rural Economy in India?

➤ **Infrastructure Development:**

- **Pradhan Mantri Gram Sadak Yojana (PMGSY)**.
- **BharatNet Project**
- **Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)** has played a pivotal role in rural electrification, bringing electricity to over 18,000 villages and boosting economic activities.

➤ **Support for MSMEs:**

- **Micro Units Development & Refinance Agency Ltd (MUDRA)**
- **Credit Guarantee Scheme for MSMEs (CGTMSE)**
- **SFURTI (Scheme of Fund for Regeneration of Traditional Industries)**

➤ **Promoting Rural Entrepreneurship and Employment:**

- **Start-up India Initiative**
- **Stand-Up India Scheme**
- **Deen Dayal Upadhyaya Grameen Kaushalya Yojana**
- **Pradhan Mantri Kaushal Vikas Yojana**
- **National Rural Livelihood Mission**

➤ **Strengthening Rural-Urban Linkages:**

- **Shyama Prasad Mukherji Rurban Mission (SPMRM)**
- **eNAM platform**

➤ **Policy Frameworks for Rural Manufacturing:**

- **One District One Product (ODOP)**

What are the Challenges to Rural Economy in India?

- **Stagnation of the Manufacturing Sector:** India's manufacturing sector has experienced stagnation, contributing only **15% to the GDP in 2023**, down from **16.1% in 2014-15**.

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- **Spatial Planning Challenge:** India's shift from **agriculture to manufacturing** has been slow and uneven, with over **40%** of the workforce still employed in **agriculture**, compared to **20% in China** and **2% in the US**.
- **Infrastructural Issues:** De-urbanisation of manufacturing in India has **shifted organised manufacturing from urban to rural areas**, reducing costs but **hindering growth** due to inadequate **rural infrastructure**.
 - **Small towns** and **rural areas** are emerging as **engines of economic growth** in India, with over half of the urban population residing in these regions, projected to grow significantly by 2050.
- **Investment Challenges:** **Private investment in rural manufacturing is limited**. Factors such as **poor physical infrastructure**, **lack of reliable land records**, and **distorted capital markets** contribute to this underinvestment.
 - The **absence of efficient resource allocation mechanisms** has restricted the entry of new, more efficient enterprises.

What Measures Can Be Taken to Boost Rural Economic Growth in India?

- **Infrastructure Investments:** Significant **investments in rural infrastructure**, including **roads, electricity, and telecommunications**, are vital for creating a conducive environment for manufacturing growth and economic development.
- **Promoting MSMEs:** Policies should focus on empowering **micro, small, and medium enterprises (MSMEs)** by ensuring easier access to **credit, land, and skill development programs**.
 - Supporting MSMEs, especially those addressing rural demands, will enhance entrepreneurship and generate employment.
 - A policy shift towards **developing small towns as industrial hubs** is crucial for balanced regional development and mitigating urban-rural disparities.
- **Focus on Skill Development:** **Skill development programs** must be aligned with industry needs to boost the employability of the rural workforce, particularly in non-agricultural sectors.
 - It will ensure they are ready for the opportunities arising from rural industrialization.

- **Promoting Women-Owned Non-Agricultural Enterprises:** These enterprises contribute to economic growth by **enhancing productivity, diversifying incomes, and promoting financial inclusion**.
 - **Women need to account for over half the new jobs created by 2030** for India to achieve an **8% GDP** growth rate.
 - Formalising these enterprises, and providing targeted business and financial support through **priority sector lending**, is crucial.
- **Enhancing Digital Infrastructure:** Expanding digital infrastructure, including **internet access and mobile connectivity** in rural areas will facilitate women's participation in non-agricultural sectors.
 - This would enable women to **leverage fintech solutions** for better financial access and efficient business management.

India Signs MoU on Critical Minerals Cooperation

Why in News?

The Ministry of Mines recently signed a **Memorandum of Understanding (MoU)** with the **International Energy Agency (IEA)** to strengthen cooperation in the **critical minerals** sector.

What is the Significance of the MoU?

- **Enhancing India's Critical Mineral Strategies:** The MoU will provide India with access to reliable data, analysis, and policy recommendations related to the critical minerals sector.
- **Aligning with Global Standards:** India will streamline its policies, regulations, and investment strategies related to critical minerals, bringing them in line with **global best practices**.
- **Capacity Building and Knowledge Exchange:** The collaboration will facilitate the exchange of technical expertise, training, and joint research between India and IEA member countries, helping India improve its capabilities in **mineral extraction, processing, and recycling** techniques.

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What are Critical Minerals and their Importance?

- **Definition and Role:** Critical minerals are essential raw materials that are crucial for the **production of energy technologies** (like batteries, solar panels, and electric vehicles), advanced manufacturing, and national security.
 - These include minerals such as **lithium, cobalt, rare earth elements, and nickel**.
- **Strategic Importance for India:** India's energy transition to renewable sources and its push for electric mobility and **green technologies** depend heavily on the availability of these critical minerals.
 - The lack of sufficient domestic reserves of such minerals makes India reliant on imports, often from geopolitically sensitive regions.

- **Critical Minerals Identification:** India has identified **30 critical minerals** based on their disruption potential, substitutability, cross-cutting usage, import reliance, and recycling rates.
 - **List:** The identified minerals include Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium, and Cadmium.
 - **States/UTs with Critical Minerals:** The states/UTs housing these minerals are Bihar, Gujarat, Jharkhand, Odisha, Tamil Nadu, Uttar Pradesh, Chhattisgarh, and Jammu and Kashmir.

Sl. No.	Critical Mineral	Percentage (2020)	Major Import Sources (2020)
1.	Lithium	100%	Chile, Russia, China, Ireland, Belgium
2.	Cobalt	100%	China, Belgium, Netherlands, US, Japan
3.	Nickel	100%	Sweden, China, Indonesia, Japan, Philippines
4.	Vanadium	100%	Kuwait, Germany, South Africa, Brazil, Thailand
5.	Niobium	100%	Brazil, Australia, Canada, South Africa, Indonesia
6.	Germanium	100%	China, South Africa, Australia, France, US
7.	Rhenium	100%	Russia, UK, Netherlands, South Africa, China
8.	Beryllium	100%	Russia, UK, Netherlands, South Africa, China
9.	Tantalum	100%	Australia, Indonesia, South Africa, Malaysia, US
10.	Strontium	100%	China, US, Russia, Estonia, Slovenia
11.	Zirconium(zircon)	80%	Australia, Indonesia, South Africa, Malaysia, US
12.	Graphite(natural)	60%	China, Madagascar, Mozambique, Vietnam, Tanzania
13.	Manganese	50%	South Africa, Gabon, Australia, Brazil, China
14.	Chromium	2.5%	South Africa, Mozambique, Oman, Switzerland, Turkey
15.	Silicon	<1%	China, Malaysia, Norway, Bhutan, Netherlands

International Energy Agency (IEA)

- **Overview:** The **IEA** is an autonomous agency that works under the framework of the **Organisation for Economic Co-operation and Development (OECD)**.
 - It was established to promote energy security, economic growth, and environmental sustainability.

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- **Focus Areas of IEA:** The IEA focuses on energy policy, data collection, energy market analysis, and recommendations for improving energy security and sustainability.
 - It also plays a key role in managing energy crises and promoting the adoption of **renewable energy**.
- **Members:**
 - The IEA family is made up of **31 member countries**, **13 association countries including India**, and 5 accession countries.
 - A candidate country to the IEA must be a member country of the OECD.
- **Major Publications:**
 - **World Energy Outlook reports**
 - **India Energy Outlook Report**
 - **World Energy Investment Report**
 - **The IEA Technology Roadmap and Policy Pathway series**

Coking Coal as Critical Mineral

Why in News?

Recently, a **NITI Aayog** report titled 'Enhancing Domestic Coking Coal Availability to Reduce the import of Coking Coal' advocated **coking coal** to be included in the list of **critical minerals**.

Why Should Coking Coal Be Declared a Critical Mineral?

- **Meeting Critical Mineral Criteria:** Coking coal meets **all the criteria** to declare coking coal as a 'critical mineral' for India.
 - Critical minerals have significant **economic importance for key sectors** in the national economy.
 - Critical minerals have a **high-supply risk** due to the **very high import dependence** and **high level of concentration** of set critical raw materials in particular countries.
 - There is a **lack of (viable) substitutes**, due to the unique and reliable properties of these materials for existing, as well as future applications.
- **Steel Production:** Coking coal is a vital **raw material for steel production**, constituting approximately **42% of the cost of steel**, which is crucial for **infrastructure development** and **job-creating sectors** in India,
 - The availability of **affordable coking coal** is crucial for the economy.
- **High Import Dependence:** India imports about **85% of its coking coal**, much higher than the **European Union's (EU) 62%**, posing risks to its **steel industry and economic stability**.
 - Domestic production of coking coal could have **saved Rs 1.5 lakh crore in FY 2023-24** for import of **58 metric tonnes** of coking coal.
- **Large Domestic Reserves:** India holds significant proved reserves of coking coal—**16.5 billion tonnes of medium-quality** and **5.13 billion tonnes of prime-quality** coal.
 - Using these reserves for metallurgical purposes can enhance **energy security**, **reduce supply chain risks**, and support domestic steel production.
- **Steel Industry's Competitiveness:** In FY 2023-24, **Integrated Steel Plants (ISPs)** imported **58 metric tonnes** of coking coal, costing approximately **Rs 1.5 lakh crore**.
 - Declaring coking coal a critical mineral can boost domestic production, **lowering steel production costs** and enhancing **global competitiveness**.
- **Full Capacity Utilisation:** The **capacity utilisation** of PSU washeries was less than **32% in FY 2022-23** while the **washed (clean) coal yields** were only **35-36%**.
 - **Investment and subsidies** for adoption of **efficient technologies** in **washery equipment** can improve their **efficiency** and reduce costs.
- **Global Practices:** EU has declared **coking coal** as a **critical raw material** along with 29 other raw materials which include '**green energy**' minerals like **lithium**, **cobalt**, and **rare earths**.

Note:

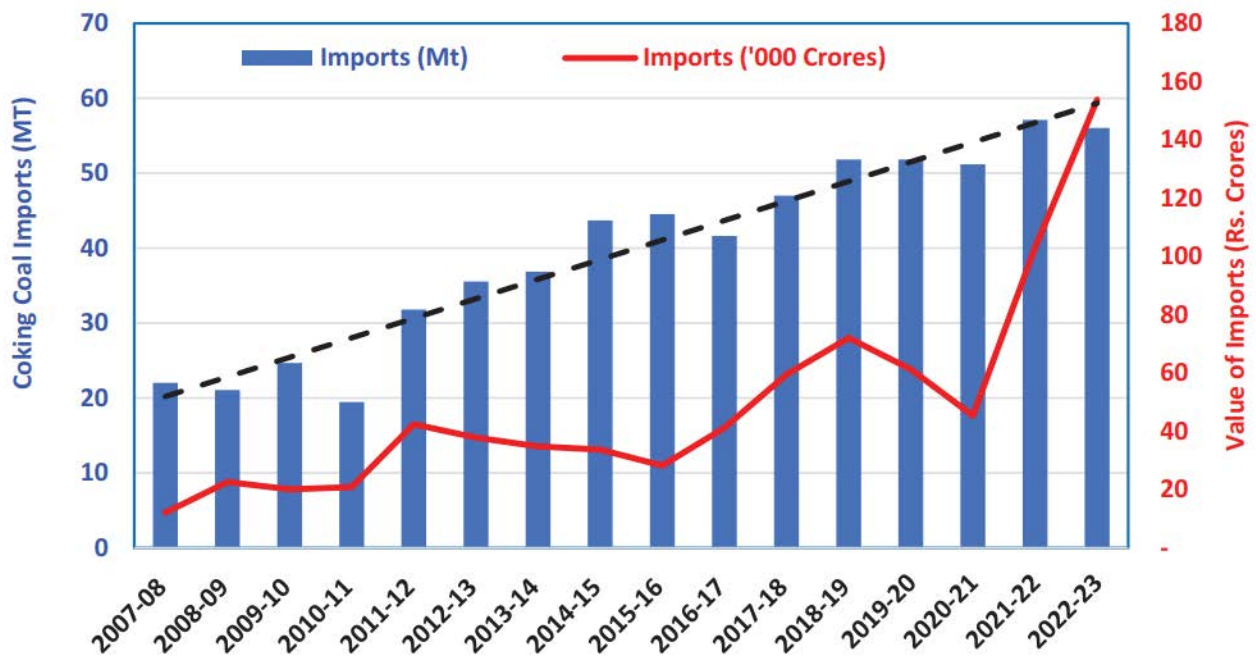


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- India's decision to similarly classify coking coal would **align with global practices** and prioritise it as a key resource for economic development.
- **Energy Security and Sustainability:** India's focus on developing domestic coking coal reserves can **reduce import reliance** and strengthen energy security while supporting its **Net Zero emissions goal** by 2070.

Coking Coal and India

- **High Dependence on Imports:** India's **coking coal imports** for the **first half (H1)** of FY25 (April-September) reached **29.6 million tonnes (mt)**, marking a six-year high.
 - Globally, **India** is the **largest importer of coking coal**.
- **Higher Steel Production:** The increase in coking coal imports coincides with a rise in India's **steel production**.
 - Globally, India is the **second largest producer of crude steel** after China.
- **Top Importing Countries:** **Australia, US, and Russia** are the largest suppliers of coking coal to India.
- **Trend in Imports:** Shipments from **Russia** saw a substantial 200% increase between H1FY25 and H1FY24.
 - **Australia's share** of India's coking coal imports has **dropped to 54%** (16 mt) in H1FY25, down from 80% (21.7 mt) in H1FY22.
- **Diversification:** There has been a **slight increase** in sourcing from **Mozambique and Indonesia**.



What are the Key Facts About Coking Coal?

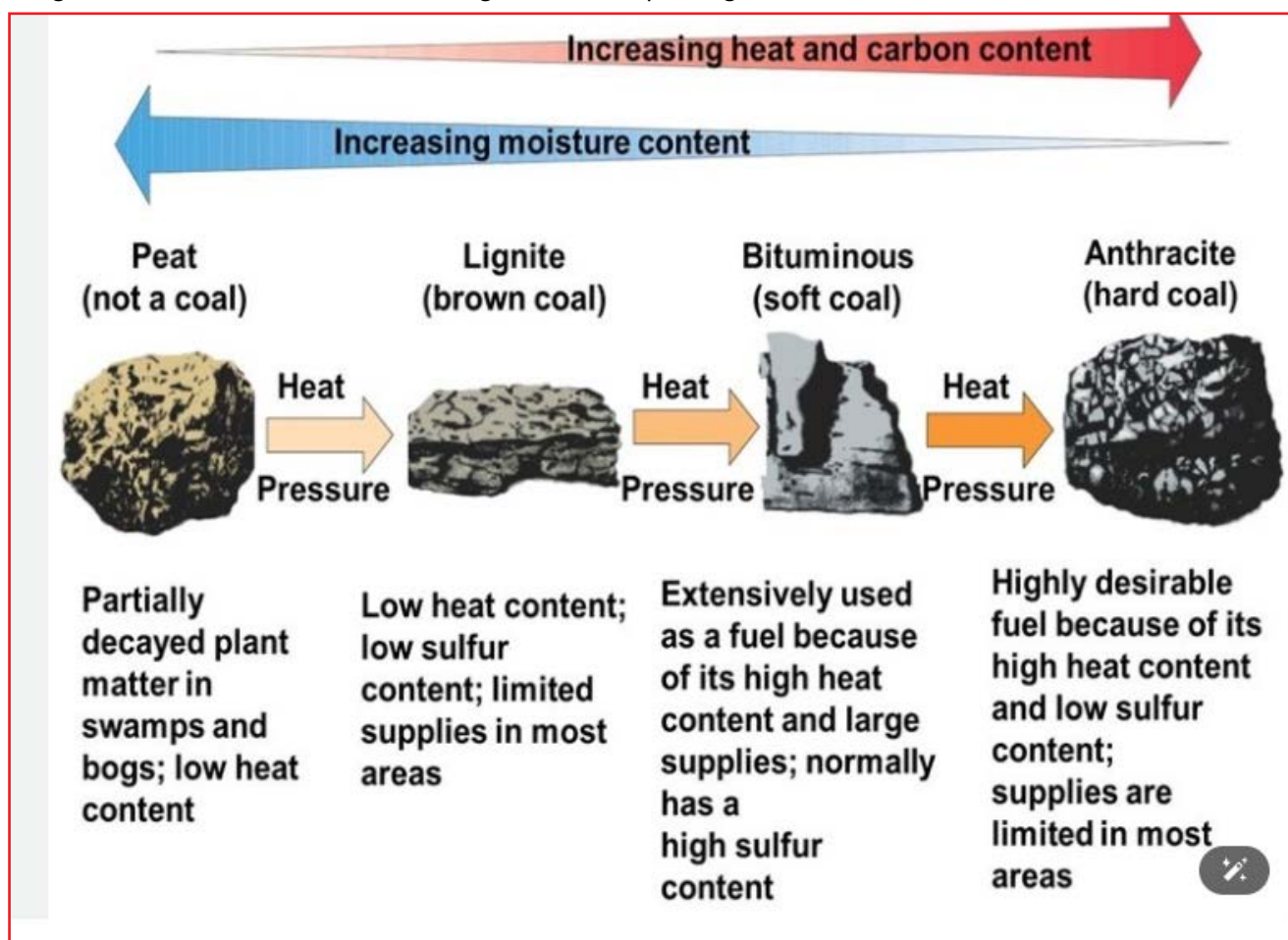
- **About:** Coking coal (or Metallurgical coal) is a naturally occurring **sedimentary rock** found within the earth's crust.
 - It encompasses a wide range of quality grades including **hard** coking coal, **semi-hard** coking-coal, and **semi-soft** coking coal. All are used to make steel.
 - Coking coal typically contains **more carbon, less ash and less moisture** than thermal coal, which is used for electricity generation.
- **Formation of Coke:** Coking coal is **heated in the absence of air** in coke ovens to produce **coke**, a porous, carbon-rich material.

Note:



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- This process, called **coking**, removes **volatile compounds** from the coal, making the coke suitable for use in the blast furnace.
- **Role in Steelmaking:**
 - **Fuel:** Coke burns at high temperatures (around 1,000°C to 1,200°C) to produce **carbon monoxide (CO)**, which is used to **reduce iron ore (Fe_2O_3) into molten iron**.
 - **Reducing Agent:** Carbon monoxide (CO) reacts with iron ore in the blast furnace to **reduce iron oxide (Fe_2O_3) into iron (Fe)**.
- **Coking Coal Production:** The largest producers of coking coal in 2022 were **China (62%), Australia (15%), Russia (9%), USA (5%) and Canada (3%)**.
- **Strategic Importance:** Steel is cited as a **strategic material** in all industries related to the low-carbon transition.
 - About **780 kg of coking coal** is needed to produce **1 ton of steel**.
- **By-Products of Coke Production:** By-products such as **tar, benzole, ammonia sulphate, sulphur, and coke oven gas** are used in chemical manufacturing and for heat/power generation.

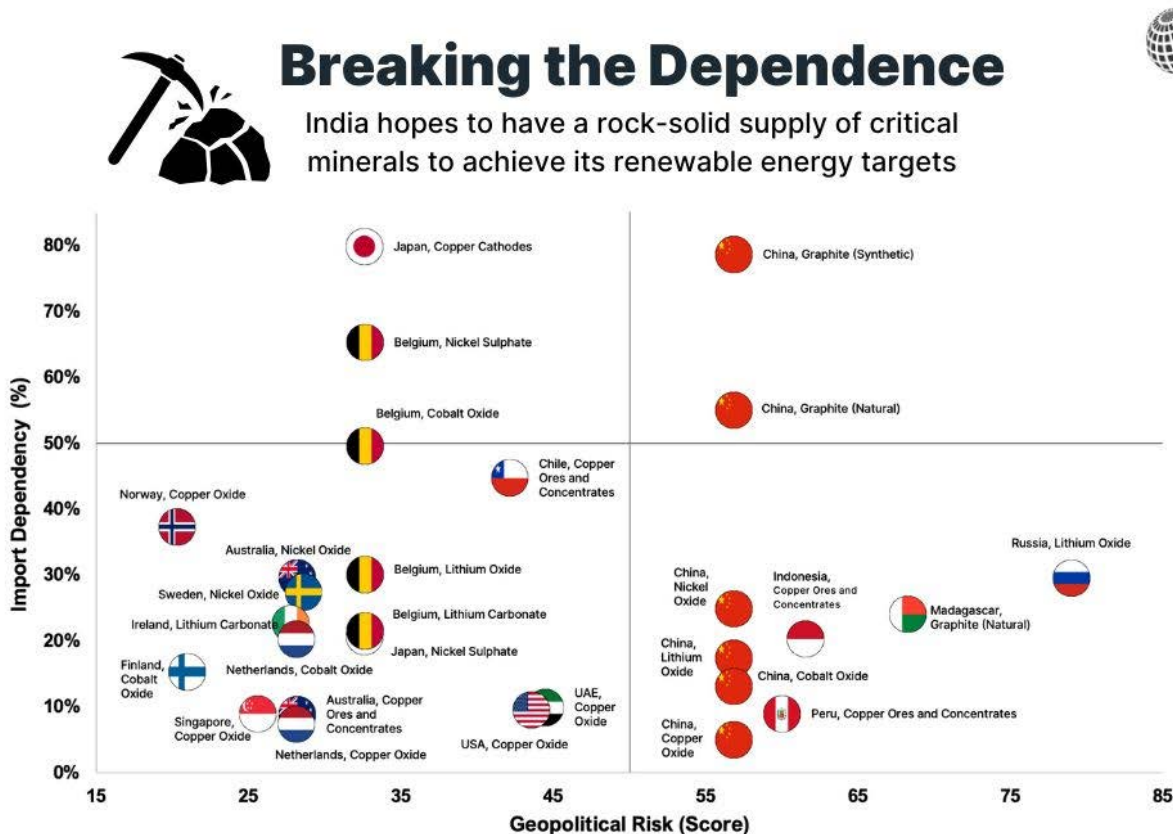


What are Critical Minerals for India?

- **Global Scenario:** The list of critical minerals **varies** among countries, depending on their **industries and priorities**.
 - For example, the **United States** has identified **50 critical minerals**, **Japan** has identified **34**, the **United Kingdom** has **18**, the **European Union** has **34**, and **Canada** has **31**.

Note:

- **Indian Scenario:** India has identified a total of **30 minerals** that are found to be most **critical** for India where India must prioritise its efforts to ensure an uninterrupted supply chain.
 - **List:** The identified minerals include Antimony, Beryllium, Bismuth, **Cobalt**, **Copper**, Gallium, **Germanium**, **Graphite**, Hafnium, Indium, **Lithium**, Molybdenum, Niobium, **Nickel**, PGE, Phosphorous, Potash, REE, Rhenium, **Silicon**, **Strontium**, Tantalum, Tellurium, **Tin**, Titanium, **Tungsten**, Vanadium, **Zirconium**, **Selenium**, and Cadmium.
 - **States/UTs with Critical Minerals:** The states/UTs housing these minerals are Bihar, Gujarat, Jharkhand, Odisha, Tamil Nadu, Uttar Pradesh, Chhattisgarh, and Jammu and Kashmir.
- **India's Import Dependency:** India is **heavily reliant** on imports for critical minerals, with **100% import dependency** for minerals like lithium, cobalt, and nickel.
 - This **dependency is likely to continue**, as demand for these minerals is expected to double by **2030**.



What are India's Initiatives to Secure Critical Minerals?

- [Mineral Security Partnership \(MSP\)](#)
- [Supply Chain Resilience initiative \(SCRI\)](#)
- [Investment Partnership with Australia](#)
- [Khanij Bidesh India Ltd \(KABIL\)](#)
- [Mines and Minerals \(Development and Regulation\) Amendment Act, 2023](#)
- [Offshore Area Minerals \(Development And Regulations\) Amendment Act, 2023](#)

Note:

Access to Medicine Index Report 2024

Why in News?

Recently, the **Access to Medicine Foundation** released its **2024 Index Report**, evaluating pharmaceutical companies' efforts to enhance medicine access in **low and middle-income countries** (LMICs) despite ongoing challenges.

What are the Highlights of the Access to Medicine Index Report 2024?

- **Exclusion from Clinical Trials:** LMICs, despite being home to **80%** of the global population, account for only **43%** of all clinical trials conducted worldwide.
 - This limits the participation of LMIC populations in the development of new medicines and delays their access to innovative treatments.
- **Limited Tech Transfers & Medicine Access:** Voluntary licensing and technology transfers are concentrated in countries like **Brazil, China, and India**, leaving much of **sub-Saharan Africa** excluded, which limits the availability of medicines in many low-income regions.
- **Gaps in Access for Low-Income Countries:** While some companies are adopting inclusive business models, over **61%** of products assessed lack specific strategies for low-income countries.
 - This underscores persistent inequities, as access efforts remain concentrated in upper-middle-income regions.
- **Decline in R&D for Priority Diseases:** Pharmaceutical companies are increasingly moving away from R&D for priority diseases such as **malaria, tuberculosis**, and neglected **tropical diseases**, which disproportionately affect LMICs.
 - The report highlighted the urgent need for **pharmaceutical companies** to enhance **efforts** and create **transparent strategies** for **equitable access to medicines**.

What are the Needs and Challenges in Accessing Medicines in LMICs?

- **The Need for Improved Access to Medicines:**
 - LMICs face a dual burden of infectious and **non-communicable diseases** (NCDs) that strain fragile

healthcare systems, according to **WHO** with **17 million** people dying from NCDs before age 70 annually, **86%** of these deaths occurring in LMICs.

- Affordable, **high-quality medicines, diagnostics**, and **vaccines** are essential to address these challenges and reduce preventable mortality.
- Moreover, strengthening **local pharmaceutical** manufacturing and distribution networks is critical to reliable supply of essential medicines and reduce dependence on imports in LMIC.
- **Challenges in Providing Medicines in LMICs:**
 - **Economic Barriers:** Access to **medicines** in low and middle-income countries (**LMICs**) is severely limited by **economic barriers**.
 - Notably the **high cost** of essential medications, including **patented drugs**, significantly restricts access for patients and healthcare systems with **limited purchasing power**.
 - **Financial Consequences:** **Out-of-pocket healthcare expenditures** force families to make devastating choices between necessary medications and other basic needs, often resulting in **catastrophic financial consequences** that exacerbate **health inequalities**.
 - **Infrastructure Challenges:** Inadequate **transportation infrastructure**, including poorly maintained roads and insufficient **cold chain facilities**.
 - This hampers the efficient distribution of medicines, particularly in **rural areas**, while unreliable electricity compromises the integrity of **temperature-sensitive medications**.
 - Disruptions in **supply chains**, particularly during pandemics or **natural disasters**, exacerbate medicine shortages in LMICs.
 - **Regulatory Issues:** **Weak regulatory frameworks** contribute to the proliferation of **substandard** and **counterfeit medicines**, undermining treatment **efficacy** and **safety**, as insufficient enforcement capabilities fail to uphold **pharmaceutical quality standards**.
 - **Pharmaceutical innovation** often focuses on diseases prevalent in **high-income countries**, leaving LMIC-specific health challenges, such as **maternal health** and childhood illnesses, largely unaddressed.

Note:



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- **Workforce Limitations:** A shortage of trained **healthcare professionals** further restricts appropriate **prescription** and **medication management**, particularly in rural settings.
 - Also, low **health literacy** and **cultural beliefs** hinder adherence to prescribed treatments, complicating efforts to ensure **equitable access** to essential medicines in LMICs.

UHC 2030 Goals

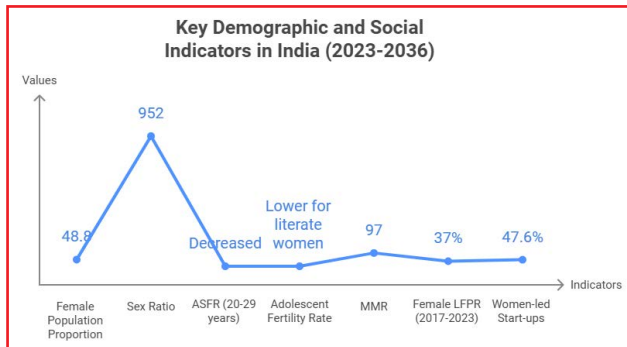
- **Universal Health Coverage (UHC) 2030** aims to provide essential health services without financial hardship, promoting equitable access and strengthened health systems worldwide.
- UHC 2030, co-hosted by **WHO**, the **World Bank**, and **OECD**, mobilises stakeholders to advance UHC through political commitment and accountability efforts.

Rethinking New Population Strategy

Why in News?

Recently, **Andhra Pradesh** reversed its longstanding **two-child policy**, which had been in place for nearly three decades and prohibited individuals with more than two children from contesting **local body elections** to control population growth.

- The government argued that the state was facing the challenges of a rapidly **aging population** and a declining **fertility rate**, which could have serious long-term **economic** and **social consequences**.



What is the Need of the New Population Strategy in India?

- **Declining Total Fertility Rate:** India's **Total Fertility Rate (TFR)** has seen a steady decline in recent decades. As per **NFHS-5 (2019-21)**, India's TFR stands at **2.0 children per woman**, which is below the **replacement level** of 2.1, below which the population begins to shrink in the long run.
 - Some states like **Andhra Pradesh** (TFR of 1.5) are already well below this threshold, raising concerns about a **shrinking workforce**.
 - This demographic shift could result in **labor shortages** and increased pressure on the working-age population, thereby reducing the potential for **economic growth**.
- **Demographic Dividend for Economic Growth:** With approximately **68% of the population in the working-age group (15-64 years)** and **26% in the 10-24 age group**, India is poised to become one of the youngest countries globally.
 - A **new population policy** is crucial for harnessing this potential and addressing future challenges, along with an adequate investment in **education**, **skills training**, and **job creation**.
- **Ageing Population:** As per the **India Ageing Report 2023** of the **United Nations Population Fund**, over **20% of India's population** will be aged 60 or above.
 - An **ageing population** in **India** poses challenges such as higher **healthcare demand** for **chronic** and **geriatric care**, necessitating **family planning policies** that address **healthy ageing** and **elderly care**.
- **Resource Scarcity and Environmental Pressure:** India's **growing population** strains **natural resources**, with cities like **Delhi** and **Bangalore** facing severe **water stress**, as **per capita water availability** drops.
 - Furthermore, **unplanned urbanization**, driven by **high population growth**, leads to **overburdened infrastructure**, **pollution**, and **slums**, highlighting the need for a **new population policy** to avoid skewed development.

Note:



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- **Rising Inequality and Low Living Standards:** Rapid **population growth** strains **public resources**, limiting access to **healthcare, education, and social services**.
 - High **fertility rates** in impoverished areas exacerbate more comprehensive **population policy** for **economic inequality**.

India's Population Policies

- **Post-Independence Initiatives (1952):** India pioneered global family planning programs, **focusing on reducing birth rates** through contraceptives and awareness campaigns.
- **National Population Policy 1976:** Recognising the link between population control and **economic development**, this policy emphasized measures such as incentivised sterilisation, increasing the **legal marriage age** (to 18 for girls and 21 for boys), and expanding access to education and healthcare.
- **Emergency Period (1975–1977):** This phase became infamous for forced sterilizations, eroding public trust in government-led population control measures.
 - It highlighted the need for more inclusive and voluntary approaches.
- **National Population Policy 2000:** This policy set immediate goals to meet contraceptive needs and reduce maternal and infant mortality, a medium-term goal of achieving **replacement-level fertility (TFR of 2.1)**, and a long-term objective of population stabilisation.
- **Current Focus Areas:** Modern strategies emphasise improving access to **contraceptives, prioritising maternal and child health**, and advocating for delayed marriage.
 - Population stabilisation is now integrated with broader goals of economic growth and environmental sustainability.
- **State-Level Policies:** Some states like **Uttar Pradesh and Assam** have introduced policies promoting a **two-child norm**, linking it with incentives or restrictions in areas such as government jobs, welfare benefits, and electoral participation.

India's Trade Deficit as an Opportunity

Why in News?

According to some economists, India's **trade deficit** is not a sign of **weak manufacturing** but reflects India's

strength in **services** and attractiveness as an **investment destination**.

What is the State of India's Trade Deficit?

- **About:** A trade deficit occurs when a country **imports more goods and services** than it exports. It represents the amount by which the **value of imports exceeds the value of exports** over a certain period.
- India's Trade Scenario:
 - **Overall Trade Deficit:** Reduced from **USD 121.6 billion (FY23)** to **USD 78.1 billion (FY24)**.
 - **Services Trade:** Services exports stands at **USD 339.62 in FY24** and Services Trade Surplus stands at **USD 162.06 billion**.
 - India's share in world services exports rose from **0.5% (1993)** to **4.3% (2022)**, making India the **7th largest services exporter** globally.
 - **Merchandise Trade:** Merchandise exports stands at **USD 776 billion (FY23)**. **Merchandise Trade Deficit** narrowed to **USD 238.3 billion (FY24)** from **USD 264.9 billion (FY23)**.
 - **Current Account Deficit (CAD):** Reduced to **USD 23.2 billion (0.7% of GDP, FY24)** from **USD 67 billion (2% of GDP, FY23)**.
 - **Capital Account Balance:** Net inflows rose from **USD 58.9 billion (FY23)** to **USD 86.3 billion (FY24)**, driven by **foreign portfolio investment (FPI)**.

Why is India's Trade Deficit not a Weakness?

- **Strength in Services:** India is a global leader in services and established a **competitive advantage** particularly **IT and pharmaceuticals** due to which it can afford to run a trade deficit in goods.
 - The export surplus in services allows India to import more goods **without destabilising** its economy.
- **Investment Destination:** When India attracts **foreign investment**, it results in a **capital account surplus**, which is mathematically balanced by a **current account deficit**.
 - Therefore, the current account deficit is a **natural consequence** of India's strategy to attract investment.
- **Competitive Exports:** When a country runs a trade deficit, there is **downward pressure** on its **currency**, making it weaker relative to other currencies.
 - A depreciated currency makes the country's **exports cheaper and more competitive** in foreign markets, potentially boosting export activity.

Note:



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- **Healthy Current Account Deficit:** India has successfully maintained a modest current account deficit of around **2% of GDP**, which is considered **sustainable**.
 - This level of deficit does **not pose an immediate risk** to the country's economic stability, as long as capital inflows match the deficit.
- **Comparative Advantage:** India's trade deficit is **not indicative of inefficiency** in manufacturing but it is based on the principle of **comparative advantage**.
 - Comparative advantage means **India exports what it is best at (services)** and imports goods where it has a **lesser advantage in production**.
- **Manufacturing Growth:** The current account deficit does not hinder the potential for greater manufacturing output.
 - **Machinery and engineering goods** imported to support **Make in India** initiative drive further **manufacturing expansion** in the Indian economy.
- **Higher Consumption Capacity:** By importing goods and services, a country can provide its citizens with a **wider range of products**, including those that may not be locally available or are more expensive to produce domestically and **raising living standards**.
- **Economic Flexibility:** When domestic production is not sufficient to meet demand, imports can fill the gap, preventing economic disruptions and ensuring that consumers and businesses have access to the goods they need.
- **Economic Integration:** Trade deficits reflect **global economic integration**, enabling access to imports that support industries and consumers.

What are the Disadvantages of Trade Deficits?

- **Loss of Economic Sovereignty:** Persistent trade deficits allow **foreign countries to buy domestic assets (opportunistic takeover)**, risking loss of control over key sectors and increasing vulnerability to external influences. E.g., **Opportunistic takeover** of Indian companies.
- **Higher Unemployment:** Persistent trade deficits in an open economy may lead to domestic businesses being **unable to compete with cheaper imports**, causing job losses and economic stagnation.
- **Twin Deficits Hypothesis:** Trade deficits are often linked to **budget deficits**, as a government may **borrow to finance** its economic needs when exports are insufficient to cover imports.

- **Deindustrialization:** Persistent deficits may lead to a **decline in domestic manufacturing** and industrial sectors, as domestic industries struggle to compete with cheaper or higher-quality imports.
- **Balance of Payments Crisis:** If trade deficits are financed by borrowing, a sudden loss of confidence from foreign investors can trigger a **Balance of Payments crisis** as happened in 1991 with India.

What Measures are Needed for a Balanced Trade?

- **Export Credit Support:** Encouraging banks to offer **affordable and adequate export credit**, especially for **micro, small, and medium enterprises (MSMEs)** to gain **economies of scale** and in **competitiveness** in foreign markets.
- **Logistics Infrastructure:** Leveraging initiatives like the **PM GatiShakti National Master Plan** and **National Logistics Policy (NLP)** to streamline operations, reduce costs, and enhance **efficiency** in the logistics sector to support **domestic manufacturing at lower cost**.
 - NLP aims to reduce the **logistics costs to 8%** of the **GDP** by **2030** from the existing **13-14%**.
- **Free Trade Agreements (FTAs):** Ensuring **FTAs** provide better terms for essential imports, enabling the country to meet **domestic demand cost-effectively**.
- **GVC Participation:** By joining **Global Value Chain (GVCs)**, Indian firms can become part of international supply chains, gaining exposure to a broader customer base and increasing export volumes.
- **Domestic Manufacturing:** Expanding the **Production-Linked Incentive (PLI)** schemes and strengthening the **Districts as Export Hubs (DEH)** initiative can boost domestic manufacturing and exports and help reduce trade deficit.
- **High Value Trade:** Increasing exports of **high-value goods and services** can reduce India's trade deficit by generating **more revenue per unit exported**.
 - E.g., companies like **Tata Motors and Mahindra Electric** can increase export of high-value **electric vehicles (EVs)**, export of renewable energy technologies such as **solar panels** etc.
- **Diversification of Export Basket:** By expanding exports into sectors like **defence equipment, aerospace, and renewable energy** (solar panels, wind turbines), India can ensure more **revenue generation** and reduce trade deficit.

Note:



- **Addressing Sanitary and Phytosanitary Barriers:** By addressing barriers like **pesticide residue limits**, **quarantine requirements**, and **animal health regulations**, India can open up new markets in **high income countries like the US** and increase its exports which can help in addressing **trade deficit**.

Rising Inflation in India

Why in News?

The **Ministry of Statistics & Programme Implementation (MoSPI)** recently reported that the **Consumer Price Index (CPI)** or the **retail inflation** surged to 6.2% in October 2024 and the Food inflation, as per the **Consumer Food Price Index (CFPI)**, rose to 10.87%.

- This marks the **highest inflation rate since August 2023**, surpassing the **Reserve Bank of India's (RBI)** upper tolerance limit of 6%.
- Despite global inflation easing, India faces persistent price pressures, leading experts to reassess forecasts and interest rate impacts.

What Factors have Contributed to High Retail Inflation in India?

- **High Food Inflation:** A significant contributor to the surge was **food inflation**, which hit a 15-month high at 10.8%.
 - Vegetable prices shot up by 42%, marking a 57-month high. Fruit prices rose by 8.4%, and pulses saw a 7.4% increase.
- **Core Inflation Uptrend:** **Core inflation**, which excludes food and fuel prices, has also edged upwards, signaling persistent inflationary pressure beyond just food.
 - Inflation in household services is climbing, reflecting higher living costs.
- **Global Price Volatility:** A sharp rise in global **edible oil prices**, driven by supply disruptions and other international market factors, has directly impacted India's inflation.
 - Since **India is a major importer of edible oils**, any increase in global prices results in higher costs for domestic consumers, **contributing to food inflation**.
- **Extreme Weather Events:** **Heatwaves** have negatively impacted crop yields, leading to **supply shortages and higher prices**.

What are the Implications of High Retail Inflation on RBI's Monetary Policy?

- **Delay in Interest Rate Cuts:** The RBI inflation target is **4%, with a tolerance band of 2% to 6%**. With inflation exceeding this threshold, immediate interest rate cuts are unlikely.
 - Experts predict that the RBI might only consider **reducing rates in 2025** if inflation shows a sustained decline.
- **Focus on Inflation Control:** The RBI will continue to **prioritize controlling inflation to maintain price stability**, as unchecked inflation undermines economic growth and purchasing power.
 - The RBI had projected inflation to moderate to **4.8% in Q3 and 4.2% in Q4 of FY 2024-25**, but this now seems less likely, affecting the future trajectory of interest rates.
- **RBI's Policy Dilemma:** The RBI faces a difficult decision, while it must curb inflation, it must also **avoid stifling economic growth**. Rising food prices and supply disruptions are major contributors to inflation, complicating policy decisions.
 - Given the persistent inflationary pressures, the **RBI may adopt a cautious approach**, waiting for inflation to decline before adjusting interest rates. Alternatively, it could implement a **tight monetary policy**, which, while controlling inflation, may also **impact economic growth**.
- **Potential Risks of Unchecked Inflation:** The RBI stated that continued inflation could undermine the **real economy, particularly industry and exports**.
 - If rising input costs are passed on to consumers, it could reduce consumer demand and negatively **impact corporate earnings**.
 - This may especially affect sectors like manufacturing, which **rely on stable input costs and margins**.

Note: The **Monetary Policy Framework Agreement (MPFA)** between the Government of India and the RBI aims to **maintain price stability while considering growth**.

- According to this agreement, if **inflation stays outside the 2% to 6% range for three consecutive quarters**, the RBI must report to the central government, explaining the reasons, proposing corrective actions, and estimating when inflation will return to the target range.

Note:

What is the Consumer Price Index?

- **About:** The CPI measures the change in retail prices of goods and services commonly purchased by households for daily consumption.
 - It is used to track inflation, with the base year for the CPI being 2012.
- **Purpose:** CPI is a widely used **macroeconomic indicator of inflation**, used by governments and central banks for inflation targeting and price stability monitoring, and as **deflators** in national accounts.
 - CPI is also used to index **dearness allowance** to employees for increases in prices.

- CPI helps understand the cost of living, **purchasing power**, and the expensiveness of goods and services.

What is the Consumer Food Price Index?

- CFPI measures inflation that focuses exclusively on the price changes of food items in a consumer's basket.
- CFPI tracks price changes of a basket of commonly consumed food items like cereals, vegetables, fruits, dairy, meat, and other staples.
 - Like the CPI, the CFPI is **calculated monthly with the base year presently used as 2012**.
- The **Central Statistical Office (CSO)**, MOSPI releases CFPI for three categories (rural, urban, and combined) separately on an all-India basis.

INFLATION AND RELATED TERMS

INFLATION

- ◆ Rise in goods/services prices; corresponding decline in purchasing power
 - **Creeping Inflation:** Mild/moderate inflation where price level persistently rises over a period of time at a mild rate (single digit inflation rate)
 - **Galloping Inflation:** Occurs when mild inflation is not checked/controlled (inflation in double/triple digits - 20/100/ 200% annually)
 - **Hyperinflation:** Prices rise a million or even a trillion percent annually (witnessed by Germany in 1920s)

CORE INFLATION

- ◆ Change in costs of goods/services but **excluding those from food/energy sectors** (due to price volatility)

HEADLINE INFLATION

- ◆ **Headline Inflation** - Change in value of all goods in the basket (including food and energy)

$$\text{Core} = \text{Headline} - \text{Food \& fuel items}$$

STAGFLATION

- ◆ When **Inflation, unemployment and economic stagnation/recession** occur simultaneously; **most difficult type of inflation** to manage
 - Witnessed by developed countries in the **1970s (US, UK)** when world oil prices rose dramatically

DEFLATION

- ◆ **Reverse of inflation** - a sustained decline in price of goods/services
 - Here, **annual inflation rate falls below 0%** resulting in an increase in the real value of money (Japan suffered for almost a decade in **1990s**)
 - **Can worsen into recession/depression**; hence, more dangerous than inflation

DISINFLATION

- ◆ When inflation rate decelerates
 - Implies that prices are rising (inflation is happening) but at a **slower rate** each passing month

Deflation is decline in prices, whereas disinflation is a decline in inflation rate



REFLATION

- ◆ Typically **follows deflation**
 - Policymakers try to **stimulate economic activity by producing inflation** (more govt spending, reduced interest rates etc.)

SKEWFATION

- ◆ **Skewness of inflation** among different sectors of the economy - **some sectors facing huge inflation while some none** and some even deflation

GREEDFLATION

- ◆ Where (corporate) **greed** is fuelling inflation; **companies increasing their prices beyond just covering costs** to maximise profits

SHRINKFLATION

- ◆ **Hidden form of inflation**; often leads to **customer frustration/dissatisfaction**
 - Practice of **reducing the size of a product while maintaining its sticker price**



Note:

Developments in India's Maritime Sector

Why in News?

The **Ministry of Ports, Shipping and Waterways**, in collaboration with the **Observer Research Foundation (ORF)**, organised the inaugural **Sagarmanthan: The Great Oceans Dialogue**, highlighting key developments in India's maritime sector, focusing on maritime logistics, ports, and shipping.

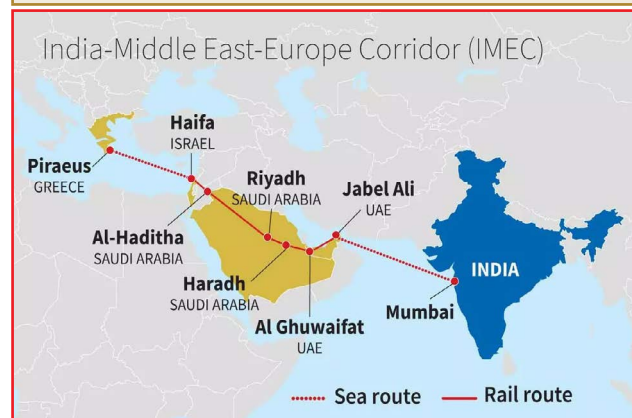
What are the Key Developments in India's Maritime Sector?

- **Chennai-Vladivostok Eastern Maritime Corridor:** It became **operational** at the end of 2023, facilitating cargo transport between **India and Far East Russia** handling key imports like **crude, food, and machinery**.
- **India-Middle East-Europe Economic Corridor (IMEC):** It announced at the **G20 New Delhi Summit 2023**, spans over **4,800 km**, connecting **India to the UAE, Saudi Arabia, Jordan, Israel, and European nations—Italy, France, and Greece**—via a railway and sea route. India and Greece are collaborating on this initiative.
- **Maritime Vision 2047:** India aims to be the **top maritime nation by 2047**, focusing on **ports, cargo, ship ownership, shipbuilding, and reforms**.
 - India is also working on building a port handling capacity of **10,000 million metric tonnes per annum by 2047**.
- **Investment in Maritime Infrastructure:** India plans to invest **Rs 80 lakh crore** in the maritime sector in key projects like **Vizhinjam international seaport** in Kerala, new mega ports at **Vadhavan (Maharashtra)** and **Galathea Bay (Nicobar Islands)**.
 - Advancement towards building ships powered by clean fuels like ammonia, hydrogen, and electricity for sustainability.
- **Port Turnaround Time:** Port turnaround times have improved significantly, reducing from over **40 to 22 hours**, surpassing nations like the US and Singapore.
 - Port turnaround time represents the time a ship takes to **unload, load, perform operations**, and be ready for the **next voyage**.

- **Revamped Legislation:** Major **Port Authority Act, 2021**, **National Waterways Act, 2016**, **Inland Vessel Act, 2021**, and **Recycling of Ships Act, 2019** had already accelerated growth in the ports, waterways, and ship recycling sectors.
 - The **Coastal Shipping Bill, 2024**, and the **Merchant Shipping Bill, 2020**, will soon boost coastal shipping, shipbuilding, and recycling in India.
- **Preserving Legacy:** The national maritime heritage complex is being built at **Lothal** to revive India's shipbuilding legacy.

IMEC

- It is a major **infrastructure and trade connectivity** project aimed at enhancing **economic and trade links** between **India, the Middle East, and Europe**.
- The proposed IMEC will consist of **Railroad, Ship-to-Rail networks and Road transport** routes extending across two corridors:
 - The **East Corridor** – connecting India to the Arabian Gulf,
 - The **Northern Corridor** – connecting the Arabian Gulf to Europe.
- The IMEC corridor will also include an **electricity cable, a hydrogen pipeline and a high-speed data cable**.



Chennai-Vladivostok Maritime Corridor

- **About:** The **Chennai-Vladivostok Maritime Corridor** is a **sea link** connecting the east coast of India with ports in the far-east region of Russia, particularly the **Chennai Port and Vladivostok Port**.
- **Distance Reduction:** The new route cuts the distance from **8,675 nautical miles (via Europe)** to approximately **5,600 nautical miles**.

Note:

- **Time Reduction:** It significantly reduces the time required to transport goods between India and Far East Russia by **up to 16 days**, with the journey now taking **24 days** compared to the previous **40 days**.
- **Strategic Importance:** Vladivostok is the largest Russian port on the **Pacific Ocean**, and it is located about **50 kilometres** from the **China-Russia border**.
- **Trade Potential:** A **feasibility study** indicates significant potential for trading **commodities** such as coking coal, oil, fertilisers, containers, and **liquefied natural gas (LNG)** between India and Russia.
- **Complementary Initiatives:** The Chennai-Vladivostok corridor is aligned with other initiatives, such as the **Northern Sea Route** and the **International North-South Transport Corridor (INSTC)**.



What are the Challenges in India's Maritime Sector?

- **Competition from China:** In less than **70 years**, China has become a global maritime power, with a large navy, coast guard, the **largest merchant fleet**, and leading ports.
 - Its **Belt and Road Initiative (BRI)** further strengthens its position as a maritime competitor.
- **Inefficient Port Infrastructure:** The **modernization of existing ports** and the construction of **new ports** have faced delays, and many objectives under the **Maritime Agenda 2010-2020** were not met by **2020**.
 - While **port connectivity** is a focus of the **Sagarmala program**, **intermodal transportation** (especially linking ports to inland transport networks) remains underdeveloped.
- **Lack of Private Sector Participation:** India's maritime economy, particularly in the context of **port-led industrialization**, still suffers from insufficient involvement of **private players**.

Note:

- **Sustainability Concerns:** Maritime trade and **port development** often face environmental scrutiny, especially with regard to **coastal ecosystem degradation** and the environmental impact of large infrastructure projects.
- **Geopolitical Challenges:** The **shifting geopolitical dynamics** and **new global maritime challenges**, such as threat of non-state actors (e.g., **Houthi attack** on commercial vessels) pose risks to India's maritime trade.
- **Dependence on Foreign Shipbuilding:** Despite strides in **indigenous shipbuilding**, India remains largely dependent on foreign technology for shipbuilding and maritime equipment.

What are Recent Government Initiatives in India's Maritime Sector?

- **Ship Repair and Recycling Mission**
- **International Maritime Dispute Resolution Centre**
- **Security and Growth for All in the Region (SAGAR)**
- **Sagar Mala Program**
- **Maritime India Vision 2030**
- **Maritime AmritKaal Vision 2047**

India's Transition Towards Workforce Formalisation

Why in News?

India's economy is undergoing a **transformative shift** toward **formalization**, redefining job structures, **employment security and social benefits** for millions, ensuring a larger segment of the population is covered by **social security systems**, offering greater economic stability and a more secure future.

- This transition, supported by the **Employee's Provident Fund Organisation (EPFO)**, enhances economic stability by integrating more workers into social security systems.

What is Formalization of the Workforce?

- **Definition:** Workforce formalisation is a **crucial step toward building an equitable and resilient Indian economy**.
 - It not only empowers workers through improved social security and working conditions but

also strengthens economic fundamentals such as **productivity, tax compliance, and global competitiveness**.

- Formalization is when jobs move from the **informal sector** (small, unregistered businesses and daily wage workers) into the **formal sector** (where employees have contracts, job security, and access to benefits).
- **Features:** Businesses operate under clear legal frameworks, ensuring compliance with laws and regulations.
 - Boosts tax revenues, **expanding the tax base** and ensuring a **fairer distribution of the tax burden**.
 - Employees **receive social security**, healthcare, and benefits under labour laws, including minimum wage enforcement, retirement benefits, pensions, and insurance.
 - **Formal businesses** have **easier access to financial services** and credit from banks and institutions.
 - Formalization encourages **entrepreneurship**, enhances competitiveness, and promotes overall economic growth.

What is Significance of Workforce Formalisation for the Indian Economy?

- **Widespread Informal Employment:** Approximately **85% of India's workforce is part of the informal sector**, which is not protected by **formal labour laws** or social security systems.
 - Formalisation ensures better access to social security, healthcare, and pensions, reducing vulnerability to economic shocks.
- **Accurate Data Collection:** Formalisation allows for better data collection on employment trends, which aids in **effective policy-making and economic planning**.
- **Increased Tax Revenue:** A formal workforce contributes more to the **tax base**, enabling the government to fund public services and infrastructure projects.
- **Reduce Black Money:** Enhances transparency, making **money laundering** and **illegal activities** harder to conduct.
- **Digital Inclusion:** Formalisation encourages the adoption of digital tools and technologies, improving efficiency and transparency in the workforce.

Note:

- **Attracts Investment:** A formal workforce offers businesses a better operating environment and encourages investment, both domestic and international.

What is EPFO and its Role in India's Workforce Formalization?

- **About:** The EPFO is one of the **world's largest social security organizations**, providing a wide range of social security benefits to millions of workers across India.
 - It was established under the **Employees' Provident Funds & Miscellaneous Provisions Act of 1952**.
 - EPFO manages over **29.88 crore accounts (EPFO's Annual Report 2022-23)**, underscoring its extensive reach and the magnitude of financial transactions it handles.
 - The EPFO is under the administrative control of the **Ministry of Labour & Employment, Government of India**.
- **Benefits of EPFO:** Ensures long-term financial security through retirement funds, insurance under **Employees' Deposit Linked Insurance (EDLI) Scheme, 1976**, monthly pensions via **Employees' Pension Scheme (EPS), 1995**, and partial withdrawals under EPF (1952) for emergencies, education, or home purchases.
 - The **Employees' Provident Fund (EPF) Scheme, 1952** allows partial withdrawals for emergencies, education, or home purchases, making it a versatile financial tool.
- **Role of EPFO in Increased Formalization:** From 2017 to 2024, over **6.91 crore members joined EPFO**, with a record 1.38 crore new members registering in the fiscal year 2022-23.
 - In July 2024 alone, **nearly 20 lakh new members were added**, indicating a steady increase in monthly registrations.
 - Many members chose to transfer their funds when changing jobs, ensuring continued access to social security benefits.
 - A significant portion of **new EPFO members are youth**, many of whom are first-time job seekers. Additionally, **more female workers are registering with EPFO**, reflecting a positive trend toward a more inclusive workforce.

- The rise in EPFO registrations highlights the **growth of formal jobs in India**, with more employees gaining access to essential benefits such as job security, retirement savings, and insurance.

What are the Challenges in Workforce Formalisation in India?

- **Cost of Formalisation:** Many **MSMEs (Micro, Small, and Medium Enterprises)** and small businesses find workforce formalisation costly and cumbersome, as nearly **80-90% of India's workforce operates informally**. Small businesses **prefer informality to avoid compliance burdens**.
 - Simplifying compliance and reducing financial barriers will be crucial in overcoming this challenge.
- **Seasonal Workforce:** Migrant and seasonal workers in agriculture, construction, and low-wage jobs **often lack formal contracts** due to frequent relocations, lack of documentation **hinder their formalisation**.
- **Resistance to Change:** Workers in the informal sector are **reluctant to formalise due to a preference for flexibility** and lack of awareness about the benefits.
- **Digital Divide:** Limited access to digital tools in rural areas hinders formal employment despite **Aadhaar** and **Unified Payments Interface (UPI)** advancements.
- **Skill Gaps:** Informal workers often lack the **necessary skills required** for formal jobs, and there is a **shortage of accessible skill development programs** for these workers.
- **Gender Inequality:** **Women face disproportionate barriers to formal employment**, including socio-cultural constraints, lack of **childcare services**, and gender bias in the workplace.

India's Initiatives Related to Formalisation of Workforce

- **e-Shram Portal**
- **Udyam Portal**
- **Pradhan Mantri Shram Yogi Maan-dhan Yojana**
- **Labour Reforms:** The **labour codes**, such as the **Social Security Code, 2020**, **Industrial Relations Code, 2020**, and **Occupational Safety, Health and Working Conditions Code, 2020**, aim to simplify archaic labour laws, improve working conditions, and make it easier for businesses to hire formally.

Note:

- **GST and Digital Payment Systems:** Goods and Services Tax (GST, 2017) and Digitalisation are helping reduce informality by encouraging businesses to operate **transparently and contribute to the tax system**.
 - Increased financial transparency via digital payment systems and streamlined indirect taxation are formalising businesses.

CSR for Agriculture Sustainability

Why in News?

With increasing contributions, the focus is on how **Corporate Social Responsibility (CSR)** can support **Indian agriculture** to become both **economically viable** and **ecologically sustainable**.

Why is CSR Needed for Agriculture Sustainability?

- **High Dependence on Agriculture:** Nearly **47%** of India's **population** depends on agriculture for employment, compared to a **global average of 25%**.
 - CSR can reduce agricultural dependency by promoting **skill development**, supporting **rural entrepreneurship, infrastructure, allied activities, and non-agri business ventures**.
- **Small and Marginal Farmers:** Over **70%** of **rural households** rely primarily on **agriculture** for their sustenance. Of this, **82%** of farmers are classified as **small and marginal**.
 - By providing access to knowledge and **hands-on experience** with modern farming practices, farmers can be better equipped to increase productivity, and reduce risks.
- **Poor Access to Finance:** **High Interest rates** and the **lack of formal credit** sources often prevent farmers from purchasing necessary **equipment, seeds** and **fertilisers**, limiting their growth and productivity.
 - Companies can collaborate with Small finance banks (SFB) and micro-finance institutions (MFIs) to offer **low-interest loans and subsidies** to facilitate access to affordable financing and credit.

- **Building Market Linkages:** Poor rural infrastructure, such as **inadequate storage facilities, transportation, and irrigation systems**, leads to post-harvest losses, inefficient supply chains, and reduced access to markets.
 - CSR can help create market linkages by creating **Farmer Cooperatives** and promoting **E-Commerce Platforms**.
- **Environmental Challenges:** Unpredictable weather patterns lead to **crop failures, loss of livestock**, and increased vulnerability to natural disasters like **floods, droughts**, and **cyclones**.
 - CSR can provide relief materials (**seeds, fodder, equipment**), and partner with **insurers** for affordable **crop and livestock insurance** to minimise losses.
- **Soil Degradation:** Improper **irrigation practices** and excessive use of **chemical fertilisers and pesticides** have led to soil degradation leading to reduced **soil fertility**, lower crop yields, and environmental damage.
 - CSR can promote **organic farming, bio-fertilizers, nano fertilisers** and natural pest control.
- **Water Scarcity:** Water scarcity threatens both **crop production and livestock farming**, making irrigation and water management a critical issue.
 - Companies can invest in **rainwater harvesting, water-efficient irrigation (e.g., drip irrigation), and watershed management** to conserve water in farming communities.

Note: "Environment and sustainability" is the **second priority** for companies with **healthcare, water, sanitation, and hygiene** being the top priority.

- Examples of CSR-supported initiatives include **grain banks, farmer schools, water conservation, and energy-efficient irrigation**.

What are the Challenges Related to CSR Implementation in Agriculture Sustainability?

- **No Clear Demarcation:** CSR activities to Agriculture are **not clearly demarcated and well-defined**.
 - Under **Schedule VII** of the **Companies Act, 2013**, activities targeting agricultural sustainability could fall under **11 of the 29 development sectors** of CSR. E.g., gender equality, poverty, technology incubators, animal welfare etc.
- **Short-Term Focus:** CSR programs often focus on **short-term goals and deliverables**, while agriculture

Note:

requires **long-term investments** and sustained support to yield significant outcomes.

- **Measurement of Social Impact:** The social impact of CSR in agriculture is often harder to measure, especially in rural areas.
 - **Evaluating improvements** in farmers' incomes, livelihoods, or well-being due to CSR projects can be **subjective and complex**.
- **Not-Aligned with Business Goals:** Many companies may find it **difficult to integrate CSR** in agriculture with their business strategies in a way that is mutually beneficial. E.g., **Cosmetic companies** have little incentive to invest in **farming practices**.
- **Ignorance of Agriculture:** Education and health **dominate** CSR funding leaving **agricultural initiatives** with limited focus.
 - Also, a major **CSR fund** is diverted to other purposes like the **PM CARES Fund** which leads to a **dip in CSR expenditure** in specific sectors.
- **Fragmented Approach:** CSR initiatives often focus on **isolated aspects** of agriculture such as providing **training, technology**, missing broader challenges like **climate change**, market access, and financing.
- **Lack of Suitable NGOs:** Corporations often struggle to find **NGOs** in rural areas that align with their **CSR objectives**, leading to challenges in identifying the right partners for project implementation.

- **Disparity in CSR Spending:** A significant portion of **CSR funds (more than 30%)** is directed to more industrialized states like **Maharashtra, Karnataka, Gujarat, and Tamil Nadu**. This leaves less funding for less-developed regions.
- **Inefficient Allocation:** Many companies focus their CSR efforts in regions where they have **existing operations or deeper ties**, rather than strategically directing funds to areas with the most significant need.

What is CSR?

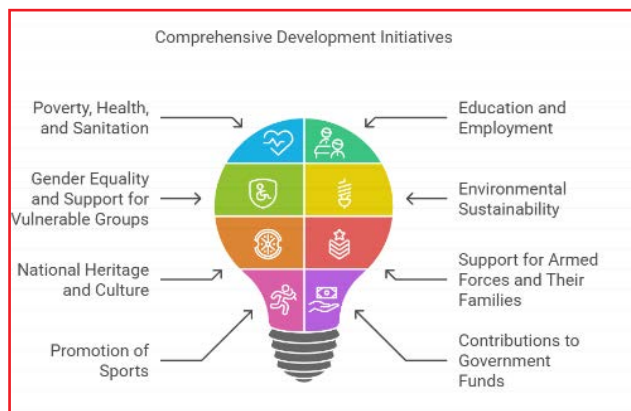
- **About:** CSR is a business practice in which companies **voluntarily integrate social, environmental, and ethical** concerns into their operations and interactions with stakeholders.
 - E.g., environmental sustainability, poverty reduction, education, and healthcare etc.
- **India's CSR Mandate:** India became the **first country to legally mandate** CSR in 2013 under **Section 135** of the Companies Act, 2013.
 - From 2014 to 2023, **Rs 1.84 lakh crore** of CSR funds were disbursed.
- **Legislative Framework:** The CSR concept in India is governed by **Section 135** of the **Companies Act, 2013**, **Schedule VII of the Companies Act, 2013** and **Companies (CSR Policy) Rules, 2014**.
 - CSR is a **mandatory requirement** for certain companies with effect from **1st April 2014**.

2007	2009	2010	2011	2012	2014
Adoption Of Inclusive Growth-11Th Five Year Plan	Voluntary Guidelines On Corporate Social Responsibility, 2009	Parliamentary Standing Committee On Finance-21St Report On Companies Bill, 2009	National Voluntary Guidelines(NVGs) On Social, Environmental & Economic Responsibilities Of Business, 2011	Business Responsibilities Reporting	Mandatory Provision Of CSR Under Section 135 Of The Companies Act, 2013 Coming Into Effect From 01/04/2014

- **CSR Criteria:** CSR provisions apply to companies that meet any of the following criteria in the preceding financial year: a net worth of over Rs 5 billion, a turnover exceeding Rs 10 billion, or a net profit greater than Rs 50 million.
 - Such companies must spend a minimum of **2% of their net profit over the last three years** on CSR activities.
 - For **newly incorporated** companies with less than three years of operations, the average **net profit of available years** is considered.

Note:

- **National CSR Data Portal:** It is an initiative by the **Ministry of Corporate Affairs** to disseminate CSR-related data and information.
- **CSR Activities:** Companies can include the following activities in their CSR policies, as specified in **Schedule VII**.



Assessing the Potential of Natural Farming

Why in News?

An analysis conducted by the **Food and Agriculture Organisation (FAO)** in collaboration with the Andhra Pradesh (AP) government suggests that the **AP model of natural farming** has the potential to double the **employment opportunities for farmers** compared to industrial agriculture, thereby reducing overall unemployment and **increasing farmers' incomes by 2050**.

- The analysis was a **part of 'AgroEco2030'**, a collective future-building exercise by the AP government, French agricultural research organisation and **FAO**.

Note :

- **Industrial Agriculture:** It refers to the large-scale, **intensive farming of crops and livestock**, typically characterised by the use of chemical fertilisers for crops and the routine, often harmful, administration of antibiotics to animals.
- **AgroEco2050 Initiative:** It aimed to assess two **potential futures** for agriculture, food, land use, nature, jobs, and incomes in Andhra Pradesh by 2050.

- One vision focused on intensifying conventional industrial farming, while the other explored scaling up **natural farming (agroecology)**.
- The goal was to compare the implications of these two pathways and assess their coherence.

What is Natural Farming?

- **About & Objective:** Natural farming is a **chemical-free approach** that relies on locally available resources, including desi cow dung and urine, and emphasises traditional, indigenous practices.
 - It eliminates the use of synthetic fertilisers and pesticides, **promoting on-farm biomass recycling, including mulching, and pest management** through biodiversity, botanical concoctions, and exclusion of all synthetic chemicals.
 - Internationally, **Natural Farming is considered a form of regenerative agriculture**—a prominent strategy to save the planet.
 - It has the **potential to manage land practices and sequester carbon from the atmosphere** in soils and plants, where it is useful instead of being detrimental.
- **Current Scenario:** Several states, including Andhra Pradesh, Karnataka, Himachal Pradesh, Gujarat, Uttar Pradesh, and Kerala, have already adopted natural farming and developed successful models.
 - While still in its initial stages, **the natural farming system is steadily gaining acceptance** within the farming community.

Zero Budget Natural Farming (ZBNF)

- **ZBNF in Andhra Pradesh:**
 - Introduced in 2016 by AP as an alternative to chemical-based, capital-intensive agriculture, **ZBNF is implemented through Rythu Sadhikara Samstha** (a non-profit created by the state's agriculture department).
 - The scheme, **now called Andhra Pradesh Community Managed Natural Farming**, aims to cover 6 million farmers over 6 million hectares.
- **ZBNF in 2019 Union Budget:**
 - The ZBNF was also **highlighted in the 2019 Union budget** in the bid to **double farmers' income by 2022**.

Note:

- It is promoted as 'Bharatiya Prakritik Krishi Paddhati' (BPKP) under the centrally sponsored scheme Paramparagat Krishi Vikas Yojana (PKVY) with a focus on encouraging **traditional and indigenous agricultural practices**.



Why Should Natural Farming be Adopted?

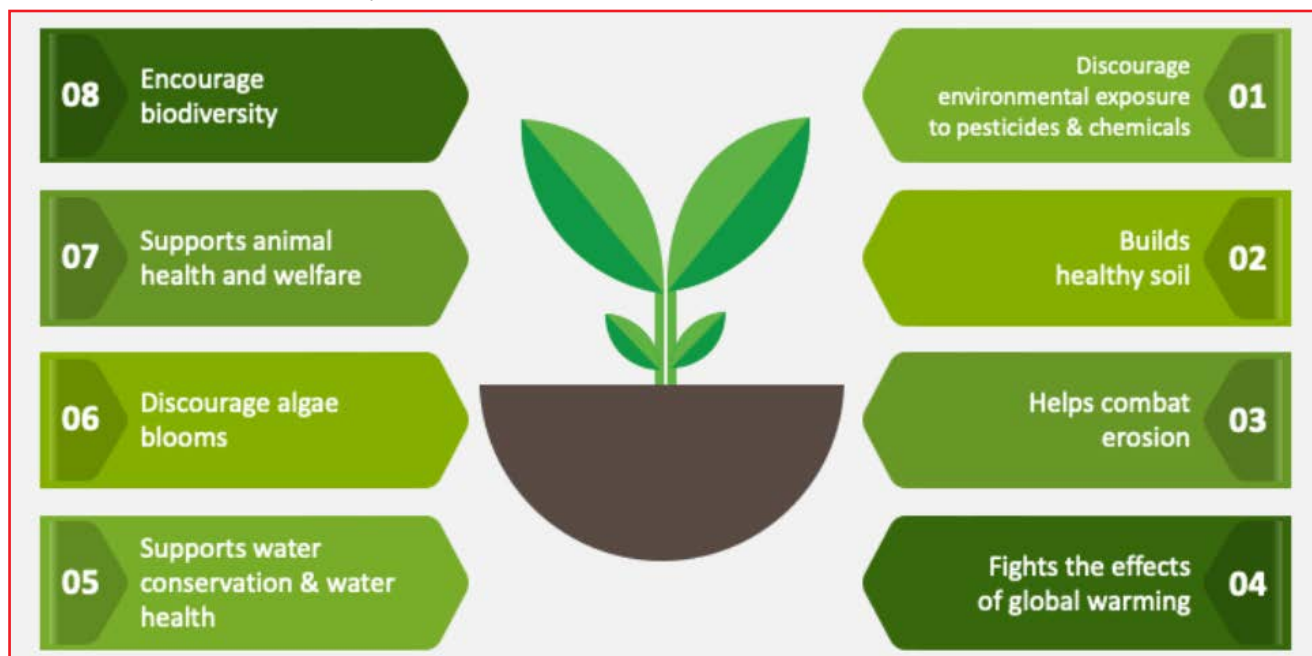
- **Employment Impact:** As per the **FAO**, by 2050, **natural farming will employ twice as many farmers as industrial agriculture**, with 10 million farmers in natural farming compared to 5 million in industrial farming.
 - This shift would reduce unemployment, which is **projected to rise to 30% in the industrial agriculture scenario**, while in the natural farming scenario, unemployment would drop to 7%.
- **Farmer Income:** Natural farming is expected to be **more profitable for farmers** due to lower production costs (seeds, chemicals, **irrigation**, credit, and machinery) and better market prices for high-quality produce.
 - The **income gap between farmers and non-farmers** would narrow significantly—from **62% in 2019**

to 22% in 2050 under natural farming. This is nearly half the income gap of 47% expected in the industrial agriculture scenario by 2050.

- **Land Use and Biodiversity:** Under **natural farming**, **the total cultivated area in 2050 would be 8.3 million hectares**, compared to 5.5 million hectares under industrial agriculture.
 - Natural farming would contribute to reversing **land degradation, desertification**, and improving biodiversity through regenerative and agroecological practices.
- **Nutritional Benefits:** Despite slightly **lower yields per hectare**, **natural farming would produce more nutritious food per capita** (5,008 kilocalories/day) compared to industrial agriculture (4,054 kilocalories/day).

Note:

- The food from natural farming would be richer in **macronutrients, micronutrients**, and fiber, and would contain no chemicals (fertilizers, pesticides) or antibiotics.



What are the Challenges Related to Natural Farming?

- **Inadequate Farmer Training and Handholding:** Farmers require more comprehensive training and continuous support to transition to and sustain natural farming practices.
 - The current training systems are insufficient in addressing the full range of needs.
- **Cumbersome Certification Process:** The certification process for organic farming, particularly the **Participatory Guarantee System (PGS-India)**, is seen as complicated and not farmer-friendly.
 - Additionally, **third-party certifications are expensive**, which is a barrier for small farmers.
 - The **National Programme for Organic Production (NPOP)**, implemented by the **Agricultural and Processed Food Products Export Development Authority (APEDA)**, grants organic farming certification through a **process of third party certification**.
- **Poor Marketing Linkages:** There is a lack of effective marketing systems for organic produce, leading to concerns about remunerative prices.
 - Without proper buy-back or procurement provisions, such as those in the **Pradhan Mantri Krishi Vikas Yojana (PMKSY)**, farmers face difficulty in selling their products at fair prices.
- **Insufficient Funding and Policy Support:** Organic and natural farming programs receive minuscule budget allocations compared to the subsidies provided for chemical fertilizers, which is a significant barrier to scaling up efforts.
 - There is also a **lack of holistic understanding and support from the scientific community**, which limits the case for change and investment in organic farming.
- **Slow Progress in State-Level Implementation:** While some states have organic policies, the implementation has been slow.
 - Despite having policies, **states like Karnataka, Kerala**, and others have not been able to achieve significant coverage or meet their targets.
- **Dependency on Chemical Inputs:** A large part of the agricultural system remains heavily reliant on chemical inputs like fertilisers and pesticides, with organic alternatives still not being widely promoted or adopted.
 - Low yields in natural and organic farming, **coupled with high susceptibility to pests and weeds**, deter **small and marginal farmers** from adopting these practices.

Note:

- For these farmers, who make up over 80% of India's agricultural community, reduced production poses a serious threat to their livelihoods, contributing to the slow adoption of such farming methods.

Initiatives Related to Natural Farming in India

- **Paramparagat Krishi Vikas Yojana (PKVY)**
- **Bharatiya Prakritik Krishi Paddhati (BPKP)/ZBNF**
- **National Mission on Natural Farming (NMNF)**

Domestic Systemically Important Banks (D-SIBs)

Why in News?

Recently, the **Reserve Bank of India (RBI)** retained the **State Bank of India**, **HDFC Bank** and **ICICI Bank** as **Domestic Systemically Important Banks (D-SIBs)**.

- The Reserve Bank designated **SBI** and **ICICI Bank** as D-SIBs in 2015 and 2016, and **HDFC Bank** joined them in 2017.

What are the Key Points About D-SIBs?

- **About:** D-SIBs are banks that are considered 'Too Big to Fail' (TBTF) within the domestic economy due to their **size, complexity, and interconnections** with the financial system.
 - These banks are classified based on the **potential economic disruption** if they fail.
- **Importance:** D-SIBs are subjected to **additional regulatory measures** like **capital buffers**, **stress tests**, and **recovery and resolution planning** to enhance their resilience and ability to withstand financial shocks.
- **Bucketing Structure:** D-SIBs are classified into different **buckets** based on their **systemic importance scores**.
 - **Bucket 1** represents the **lowest risk**, while **Bucket 4** represents the **higher risk**.
 - The **RBI** has placed **SBI** in **bucket 4**, **HDFC Bank** in **bucket 3** and **ICICI Bank** in **bucket 1**.
- **Capital Requirements:** Based on the bucket in which a D-SIB is placed, an **additional common equity requirement** has to be applied to it.
 - **SBI** has an additional **0.80% common equity tier 1 (CET1)** requirement, **HDFC Bank** has **0.40%**, and **ICICI Bank** has **0.20%**.

- **Selection Process:** The RBI follows a **two-step process** for identifying D-SIBs.

- **Sample Selection:** Not all banks are assessed. **Only those** with significant systemic importance based on **size** (banks with assets over **2% of GDP**) are considered.
- **Systemic Importance Assessment:** Based on a range of **indicators** like **lack of substitutability**, **interconnectedness** etc a **composite score** is calculated for each bank, and those **exceeding a certain threshold** are classified as D-SIBs.
- **Framework for D-SIBs:** RBI issued a **framework** in **July 2014** to ensure D-SIBs are well-capitalised to **absorb losses** and **prevent systemic disruptions** if they fail.
- **Global Systemically Important Banks (G-SIBs):** **G-SIBs** are **large international banks** whose failure would have a global impact.
 - **Financial Stability Board (FSB)**, in consultation with **Basel Committee on Banking Supervision (BCBS)** and national authorities identifies G-SIBs.
 - As of **2023**, there are **29 G-SIBs** including **JP Morgan Chase**, **Bank of America**, **Citigroup**, **HSBC**, **Agricultural Bank of China**, **Bank of China**, **Barclays** and **BNP Paribas**.

Note:

- **Common Equity Tier 1 (CET1)** covers **liquid bank holdings** such as **cash and stock**. CET1 is a capital measure that was introduced in **2014** as a **precautionary way** to protect the economy from a financial crisis.
- The **FSB** is an **international body** that **monitors** and makes recommendations about the **global financial system**.
 - FSB was established in **2009** under the aegis of **G20**.

Dhudmaras Village

Why in News?

Dhudmaras, a village in Chhattisgarh's Bastar district, has been selected to **participate in the Best Tourism Village Upgrade Programme (BTVUP)** under the **United Nations Tourism for Rural Development Programme (UNTRDP)** by the **UN World Tourism Organisation (UNWTO)**.

Note:



drishti

- This recognition marks its potential as a hub for **eco-tourism** and sustainable development.

What are the Key Facts About Dhudmaras Village?

- **Location:** Dhudmaras, located in **Kanger Valley National Park(KVNP)**, is surrounded by dense forests, the **Kanger River**, and rich biodiversity, making it a prime eco-tourism destination.
 - KVNP is named after the **Kanger River**, which flows through it. It was designated as a **national park in 1982**.
 - KVNP is home to three notable caves **Kutumbasar, Kailash and Dandak** famous for their **stalagmites** (mineral formations that rise from the floor of a cave) and **stalactites** (mineral formations that hang from the ceiling of a cave).
 - The park is dominated by **Sal, Teak, and Bamboo**, forming a **moist deciduous forest**.
- **Cultural Significance:** Dhudmaras, home to the Dhurwa Tribe, offers visitors a chance to experience authentic tribal life through homestays, traditional food, and guided tours.
 - The Dhurwa Tribe, part of the **Gond Tribe**, speak Paarji, a **Gond dialect**. Their lifestyle is closely tied to nature, relying on forests and natural resources for sustenance.
- **Recognition and Support:** As part of the UNWTO's initiative under the BTVP, Dhudmaras will now receive **assistance to enhance areas like economic sustainability, environmental sustainability, and tourism development**, ensuring long-term growth.

What is the UN Tourism for Rural Development Programme?

- **About:** UNTRDP promotes **development, inclusion, and innovation** in rural areas through tourism, aiming

to combat depopulation and encourage sustainable practices.

- **Evaluation Criteria:** Villages participating in the program are **evaluated under nine key areas**, which include cultural and natural resources, economic and social sustainability, tourism development, and infrastructure, among others.
 - This evaluation ensures that the selected villages meet standards of **sustainability, inclusiveness, and governance**.
- **Three Pillars of UNTRDP:**
 - **Best Tourism Villages by UN Tourism:** Recognizes rural tourism destinations for their cultural and natural assets, community values, and commitment to innovation and sustainability.
 - **BTVP:** Assists villages in improving weak areas to fast-track applications for Best Tourism Village recognition.
 - **The Best Tourism Villages Network:** Offers a platform for sharing experiences and collaborating on best practices in rural tourism, connecting experts, communities, and stakeholders.

United Nations World Tourism Organisation

- The UNWTO, established in 1975 and headquartered in **Madrid, Spain**, promotes responsible, sustainable, and accessible tourism.
- **It has 159 member countries, including India**, it serves as a global forum for tourism policy, advocates the **Global Code of Ethics for Tourism**, and aligns tourism with the **2030 Agenda for Sustainable Development**.
 - **Target 8.9 of the Sustainable Development Goals (SDGs)** focuses on promoting sustainable tourism that creates jobs and preserves local culture and products.



Note:

International Relations

Highlights

- India and the High Seas Treaty
- 6th AITIGA Joint Committee Meetings
- 11th ADMM-Plus Meeting and Buddhism
- 2nd India-CARICOM Summit
- G20 Rio de Janeiro Leaders' Declaration
- 2nd India-Australia Annual Summit
- PM's Visit to Nigeria, Brazil and Guyana

India and the High Seas Treaty

Why in News?

India signed the **High Seas Treaty**, formally known as the **Biodiversity Beyond National Jurisdiction (BBNJ) Agreement**, in September 2024, marking a major milestone in **international ocean governance**.

- However, implementation and geopolitical challenges raise concerns about its effectiveness.

What is the High Seas Treaty?

- **About:** The BBNJ Agreement developed under the framework of **United Nations Convention on the Law of the Sea (UNCLOS)** focuses on conserving and sustainably using marine biological diversity in **areas beyond national jurisdiction**, which are beyond the 200 nautical miles (370 km) of **Exclusive Economic Zones (EEZs)**
 - The BBNJ Agreement once it enters into force becomes the third implementing agreement under the **UNCLOS**, complementing:
 - The **1994 Part XI Implementation Agreement** (focused on mineral resource exploration in the international seabed).
 - The **1995 UN Fish Stocks Agreement** (focused on conserving and managing straddling and migratory fish stocks).
 - The agreement contributes to achieving **Sustainable Development Goals (SDGs)**, particularly **SDG 14 (Life Below Water)**.

- **Need:** High seas cover **64% of the ocean surface and 43% of the Earth's area**. They are home to about **2.2 million marine species** and up to a trillion **microorganisms**.
 - These areas **belong to no nation**, allowing equal rights for navigation, economic activities, and scientific research.
 - In 2021, an estimated **17 million tonnes of plastic** were dumped into oceans, with this number expected to rise. Lack of accountability leads to **overexploitation, biodiversity loss, pollution, and ocean acidification**.
 - The treaty is vital for ensuring sustainable resource use, protecting biodiversity, and holding polluters accountable.
- **Objectives of the Treaty:**
 - **Marine-Protected Areas (MPAs):** Focuses on establishing and regulating areas where ocean systems, including biodiversity, are under stress due to human activities or climate change, akin to **national parks or wildlife reserves on land**.
 - These areas aim to conserve marine biodiversity and ecosystems.
 - **Marine Genetic Resources:** Ensuring equitable sharing of benefits arising from the use of **marine genetic resources**, including drug development, and promoting open access to **knowledge** generated from these resources.
 - **Environmental Impact Assessments (EIA):** Mandating prior **EIAs** for activities potentially harmful to **marine ecosystems**, including those within national jurisdictions that may affect the high seas, with public disclosure of the assessments.

Note:



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- **Capacity Building and Technology Transfer:** Focuses on supporting small island states and landlocked nations in conservation efforts and enabling them to **benefit from sustainable marine resource use** through capacity building and technology transfer.

- **Signing and Ratification:** The treaty would become **international law 120 days after at least 60 countries** submit their formal ratification documents. According to the **High Seas Alliance**, as of November 2024, 105 countries have signed the treaty, but only 15 of them have ratified and submitted it.

Note: Ratification is the process by which a country legally commits to an international law, distinct from signing,

- Signing indicates that a country agrees with the provisions of the international law concerned, and is willing to abide by it. **Until ratified, a country is not legally bound to follow the law.**



UN HIGH SEAS TREATY

aka BBNJ (Biodiversity Beyond National Jurisdiction) Agreement

For the first time, UN members have agreed on a unified (legally-binding) treaty to protect biodiversity in the high seas

High Seas (HS)	All the saltwater bodies across Earth that aren't part of territorial sea/internal waters of a state	Need to Protect HS	<ul style="list-style-type: none"> Only 1.2% of HSs are currently protected 10% of global marine species at risk of extinction High exploitation due to commercial fishing, mining, acidification, pollution
Background of Treaty	Demand for an updated framework to protect marine life in the High Seas, is about 20 years-old		

The last int'l agreement on ocean protection was UNCLOS signed in 1982

This treaty is the 3rd "implementing agreement" under UNCLOS

KEY FEATURES

- Create a new body to manage conservation of ocean life and establish marine protected areas in the high seas
- Estd. ground rules for conducting EIAs for commercial activities in oceans

KEY PLAYERS

EU, US, UK and China (in brokering the deal)

SIGNIFICANCE

- Achieving the 30x30 Target set at UN CBD COP15
- Legal protection of 2/3rd of the ocean (+ livelihoods of coastal communities)
- Comprehensive protection of endangered species/habitats on >40% of Earth's surface

ROADBLOCK

How to fairly share marine genetic resources (MGR) & eventual profits among developed/developing nations



Ocean ecosystems produce half the oxygen we breathe, represent 95% of the planet's biosphere and soak up CO₂ (world's largest carbon sink)

Note:

What is the Significance of the High Seas Treaty for India?

- **Economic Benefits from Blue Economy:** India's **blue economy** contributes **4% of its GDP**, with eco-tourism, fisheries, and aquaculture providing millions of jobs, especially in coastal areas like Kerala.
 - Countries like those in Africa and India, with fleets mainly operating in their **EEZs**, are vulnerable to exploitation by **foreign fleets** in international waters.
 - The treaty could help **regulate fishing** in these areas, ensuring sustainable use.
 - The **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**, aims to boost the fisheries sector. Signing the High Seas Treaty will help protect fisheries and unlock new revenue in **sustainable marine industries**.
- **Addressing Climate Change:** The Treaty's focus on marine ecosystems as **carbon sinks** is vital for combating climate change.
 - For India, healthy marine ecosystems serve as **buffers against coastal erosion**, extreme weather, and **rising sea levels**.
 - The treaty promotes **nature-based solutions (NbS)** like **seascape restoration** and MPAs, crucial for protecting **coral reefs**, which are at risk of collapse due to **global warming**.
 - India's support for the treaty could play a key role in reversing coral reef decline.
- **Alignment with SDGs and Global Commitments:** Ratifying the High Seas Treaty would align India with **SDGs 13(Climate Action)** and 14, reinforce its **Nationally Determined Contributions (NDCs)** under the **Paris Agreement, 2015** and support **Mission LiFE (Lifestyle for Environment)** and **SAGAR** Initiative.
 - It would position India as a global leader in sustainable development and marine biodiversity protection.

What Challenges Does the High Seas Treaty Face?

- **Lack of Ratification:** The High Seas Treaty faces significant challenges, including slow ratification, with only 15 of 105 signatories approving it, due to geopolitical concerns.

- Disputes over maritime territories, such as in the **South China Sea**, hinder the creation of MPAs.
- Countries in Southeast Asia and those bordering the **Bay of Bengal** fear that MPAs may **undermine sovereignty and national economic interests**, complicating the **balance between conservation and national priorities**.
- **Marine Genetic Resources:** The treaty's provisions on sharing benefits from marine genetic resources raise accountability concerns, with the risk that **wealthier nations may monopolize profits**, marginalizing less-developed states and exacerbating existing inequities.
- **Overlap with Existing Frameworks:** The High Seas Treaty may conflict with the **Convention on Biological Diversity (CBD)** due to overlapping provisions on **marine genetic resources, area-based management tools**, and EIAs.
 - The overlap with existing frameworks could **fragment ocean governance**, complicating enforcement and hindering smaller states' compliance with international norms.
- **Lack of Clarity in Implementation:** The Treaty sets broad objectives but lacks clear implementation guidelines, leading to inconsistent application.
 - While EIAs are mandated, the treaty lacks specified procedures for conducting and enforcing EIAs, which could limit its effectiveness, especially in regions with limited capacity.
 - It also neglects ongoing environmental damage from activities like **oil and gas exploration** and It fails to address the interconnectedness of marine ecosystems, particularly the **impact of EEZ activities**, such as overfishing and pollution, on high seas ecosystems.
- **Capacity-Building and Technology Transfers:** The treaty lacks enforceable mechanisms for technology transfer, can potentially exclude low- and middle-income countries from its benefits and perpetuate inequalities.
 - Additionally, **many regions lack robust institutions** to monitor and enforce treaty provisions. **Conflicting domestic and international legal standards** further dilute its effectiveness.

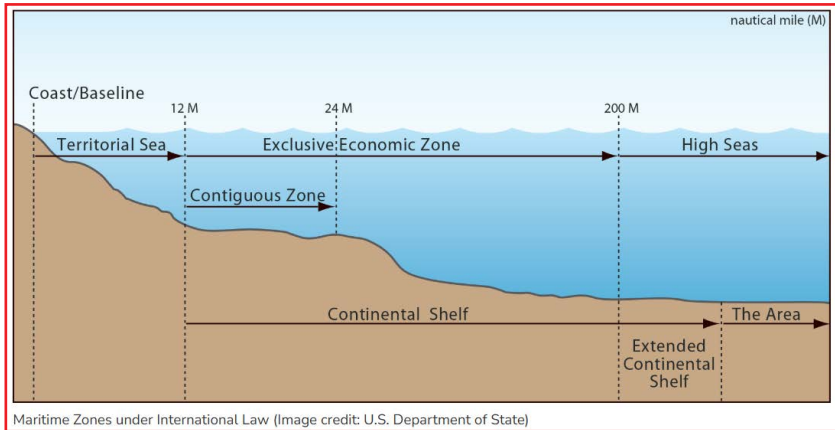
Note:

How Can the High Seas Treaty Address its Implementation Gaps?

- **Integration of Coastal and High-Seas Governance:** Develop a cohesive framework linking high-seas management with coastal regulations. Coastal states should align domestic laws with international norms for better synergy.
- **Incentivizing Compliance:** Offer technical and financial assistance to Global South nations for capacity-building.
 - Wealthier nations must ensure equitable resource sharing and fund development efforts.
- **Strengthening Enforcement Mechanisms:** Establish robust monitoring and accountability frameworks. Enhance transparency through international oversight of EIAs and profit-sharing mechanisms.
- **Building Political Consensus:** Resolve geopolitical tensions, particularly in disputed regions like the South China Sea. Foster multilateral cooperation to ensure the treaty's success.

United Nations Convention on the Law of the Sea

- UNCLOS, often referred to as the "Constitution of the Oceans," is an international law that defines the rights and duties of nations regarding the use of seas and oceans, covering sovereignty, passage rights, and economic usage.
- It demarcates marine areas into five main zones namely- Internal Waters, Territorial Sea, Contiguous Zone, Exclusive Economic Zone (EEZ) and the High Seas.



UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

The 1982 United Nations Convention on the Law of the Sea (UNCLOS), also called *Constitution for the oceans*, has 168 parties, and sets out the legal framework within which all activities in the oceans and seas must be carried out.



The Convention has created three new institutions on the International level



THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA 01

An independent judicial body. It has jurisdiction over any dispute concerning the interpretation or application of the Convention, and over all matters specifically provided for in any other agreement which confers jurisdiction on the Tribunal

02 THE INTERNATIONAL SEABED AUTHORITY

ISA has the mandate to ensure the effective protection of the marine environment from harmful effects that may arise from deep-seabed related activities



THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF 03

To facilitate the implementation of the UNCLOS in respect of the establishment of the outer limits of the continental shelf beyond 200 nautical miles (M) from the baselines from which the breadth of the territorial sea is measured

6th AITIGA Joint Committee Meetings

Why in News?

Recently, the 6th **ASEAN-India Trade in Goods Agreement (AITIGA)** Joint Committee and related meetings were held in New Delhi.

- It marked a crucial phase in reviewing the AITIGA to enhance trade relations between India and ASEAN nations.

Note:



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What are Key Highlights of the 6th AITIGA Joint Committee Meetings?

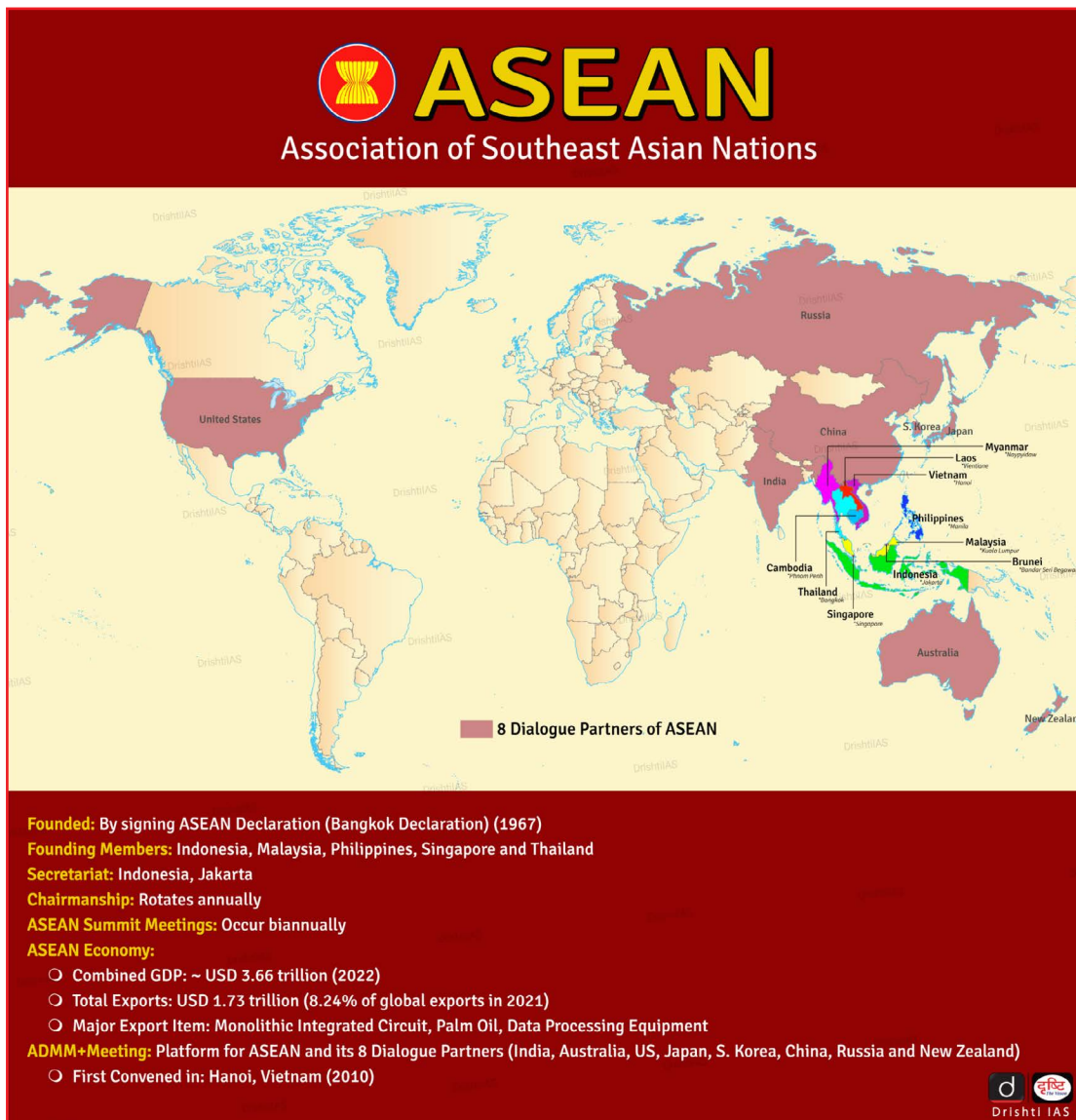
- **Review Demand by India:** India had sought a review of the AITIGA, originally implemented in **2010**, citing **disproportionate trade benefits** for ASEAN countries.
 - While India's exports to ASEAN increased from **USD 25.62 billion (FY 2010-11)** to **USD 41.2 billion (FY 2023-24)**, imports surged from **USD 30.6 billion** to **USD 79.66 billion** in the same period.
- **India's Objectives in the Review:**
 - **Enhanced Market Access:** India wants ASEAN countries, particularly **Vietnam**, to make greater market-opening commitments for Indian goods.

- **Stricter Rules of Origin (ROO):** India seeks more stringent **ROO** provisions to prevent **Chinese goods** from being routed through ASEAN nations at **preferential rates**.

- **Advancement in Negotiations:** India and ASEAN made initial progress towards **initiating tariff negotiations**, a crucial step in the review process.

Note: ASEAN accounts for approximately **11%** of India's global trade.

- Bilateral trade reached **USD 121 billion** in FY 2023-24 and stood at **USD 73 billion (April-October 2024)**, marking a **5.2% growth**.
- India's **trade deficit** with ASEAN widened from **USD 4.98 billion in 2010-11**, the first full year of operation of AITIGA to **USD 38.4 billion in 2023-24**.



Note:

11th ADMM-Plus Meeting and Buddhism

Why in News?

Recently, India's Defence Minister addressed the 11th **ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus)** forum held in Vientiane, Lao PDR.

- He emphasised the role of **Buddhist principles** in resolving conflicts and celebrated a decade of India's **Act East policy (AEP)**.

What are the Key Highlights of the 11th ADMM Meeting-Plus?

- **Freedom of Navigation:** India highlighted the need for adherence to the **United Nations Convention on the Law of the Sea (UNCLOS), 1982** for freedom of navigation and overflight in the **Indo-Pacific region**.
 - India advocated for a **Code of Conduct** that protects the **rights and interests** of nations that remain consistent with **international law**.
- **International Order:** India called for greater adoption of **Buddhist principles** of peaceful coexistence in a world that is increasingly **polarised into blocks and camps**.
- **Advocacy for Dialogue:** India's approach to **border disputes, trade agreements**, and other challenges demonstrates its belief in **open communication** to foster trust, understanding, and cooperation.
- **Asian Century:** India described the **21st century** as the **"Asian Century,"** emphasising ASEAN's economic dynamism and its **vibrant trade, commerce, and cultural exchanges**.
- **Decade of the Act East Policy:** India Highlighted the success of **India's Act East Policy**, which has strengthened ties with **ASEAN and Indo-Pacific nations** over the past decade.
 - The Act East Policy was launched in **November 2014** at the **12th ASEAN-India Summit 2014** held in Myanmar capital **Naypyidaw**.
- **Climate Change and Defence:** India proposed the development of an **ADMM-Plus Defence Strategy on Climate Change** to tackle interlinked security and environmental challenges.

- **Global Commons:** India underscored the importance of safeguarding **Global Commons**, which include **shared natural resources** beyond national boundaries.
 - Global Commons include **High Seas, Atmosphere, Antarctica and Outer Space**.

Note: India quoted **Rabindranath Tagore's 1927 remark** during his Southeast Asia visit: **"I saw India everywhere, yet I couldn't recognise it."**

- The statement symbolises the **deep and widespread cultural & historical ties** between India and SouthEast Asia.

What is ADMM-Plus Forum?

- **About:** It is a multilateral defence cooperation framework that brings together the defence ministers of the **10 ASEAN member states, 8 Plus countries (dialogue partners), and Timor Leste**.
 - **ASEAN Members** include Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam.
 - **8 Dialogue partners** include **India, China, Russia, Japan, South Korea, Australia, New Zealand and the US**.
- **Establishment:** The Inaugural ADMM-Plus was convened in **Ha Noi, Viet Nam, on 12th October 2010**.
 - Since **2017**, the ADMM-Plus **meets annually**, to allow enhanced dialogue and cooperation among **ASEAN and the Plus Countries**.
- **Focus Area:** The ADMM-Plus currently focuses on **seven areas** of practical cooperation, namely
 - Maritime security (MS)
 - Counter-terrorism (CT)
 - Humanitarian assistance and disaster management (HADR)
 - Peacekeeping operations (PKO)
 - Military medicine (MM)
 - Humanitarian mine action (HMA)
 - Cyber security (CS)
- **Experts' Working Groups (EWGs):** EWGs have been established to facilitate cooperation in these areas.
 - The EWGs are each **co-chaired by one ASEAN Member State and one Plus Country**, operating in a **three-year cycle**.

Note:

Spread of Buddhism to Southeast Asia


- **Cultural Crossroads:** Indian **traders, sailors, and monks** helped spread Buddhism to Southeast Asia, with ports like **Srivijaya (Sumatra, Indonesia)** and **Champa (Vietnam)** serving as key centres for learning and cultural exchange from the **7th to 13th centuries**.
- **Legitimacy of Rulers:** Southeast Asian rulers adopted Buddhism to strengthen their authority, aligning with figures like **Buddha or Hindu deities** to legitimise their rule.
 - The **Srivijaya Empire**, centered in **Sumatra**, was a key player in the spread of **Buddhism**.
- **Fusion of Hinduism and Buddhism:** In Southeast Asia, **Buddhism** often **blended** with local beliefs and **Hinduism**.
 - Buddhist and Hindu temples in Southeast Asia, like **Angkor Wat (Cambodia)** and **Borobudur (Indonesia)**, showcase this fusion.
- **Cultural Diffusion:** Buddhism influenced the local cultures of places like **Bali and Java**, seen in their **dance, rituals, and temple architecture**.

What is the Role of Buddhist Ideals in Conflict Resolution?

- **Buddhist Perspectives:** Three vital **Buddhist perspectives** that can help us resolve or minimise conflict.
 - Everyone is a **Buddha**, worthy of **utmost respect**.
 - Dialogue is the **most powerful** means of creating **understanding and respect** among people.
 - Our **inner transformation** is the key to changing the world (reducing the **poison of anger** which includes **greed (lobha)**, **hatred (dvesha)**, and **delusion (moha)**).

- **Adhikaraṇasamathadhamma:** Buddhist text **Vinaya Pitaka** outlines **adhikaraṇasamathadhammā**, principles for **resolving monks' conflicts**.
 - It provides detailed guidelines for monks on **confession, reconciliation, resolving disputes, and healing splits** in the Sangha.
 - It applies to anyone seeking reconciliation of differences, whether **personal or political**.
- **Middle Path (Madhyam Marg):** Advocating **balanced policies** that consider all stakeholders' needs, fostering **equitable solutions** while avoiding extremes.
- **Interdependence (Pratītyasamutpāda):** Promoting **mutual understanding and shared responsibility** among nations to address global issues like **climate change and resource conflicts**.
- **Karuna (Compassion):** Prioritising **humanitarian aid** and addressing the root causes of suffering in conflict zones, such as **poverty and inequality**.

BUDDHISM



ORIGIN

- 6th century BC, based on the teachings of Gautam Buddha

MAIN FEATURES

- Essence** - Attainment of enlightenment (Nibbana)
- Supreme Deity** - None

PRINCIPLES

- Avoid the extremes; follow Madhyam Marg (middle path)
- Individualistic component (everyone is responsible for their own happiness)
- 4 Noble Truths:
 - Dukkha (suffering)
 - Samudya (cause of suffering)
 - Nirodha (suffering could be ended)
 - Atthanga Magga (8-fold path to achieve this)
- 8-Fold Path:
 - Right - view, intention, speech, action, livelihood, mindfulness, effort and concentration

BUDDHISM REJECTS

- Authenticity of Vedas
- Concept of soul (atman) (unlike Jainism)

MAJOR BUDDHIST TEXTS

- Sutta Pitaka** (main teachings of Buddha - Dhamma)
- Vinaya Pitaka** (rules of conduct for monks/nuns)
- Abhidhamma Pitaka** (philosophical analysis)
- Other imp texts - Divyavadana, Dipavamsa, Mahavamsa, Milind Panha

Buddha's teachings were rehearsed, authenticated & divided in 3 Pitakas at the 1st Buddhist Council

These teachings were written down c. 25 BC in Pali

4 BUDDHIST COUNCILS

Buddhist Council	Patron	Venue	Chairman	Year
First	Ajatashatru	Rajgriha	Mahakashyapa	483 BC
Second	Kalashoka	Vaishali	Sabbakami	383 BC
Third	Ashoka	Patliputra	Mogaliputra	250 BC
Fourth	Kanishka	Kundalban (Kashmir)	Vasumitra	72 AD

What is India's Act East Policy (AEP)?

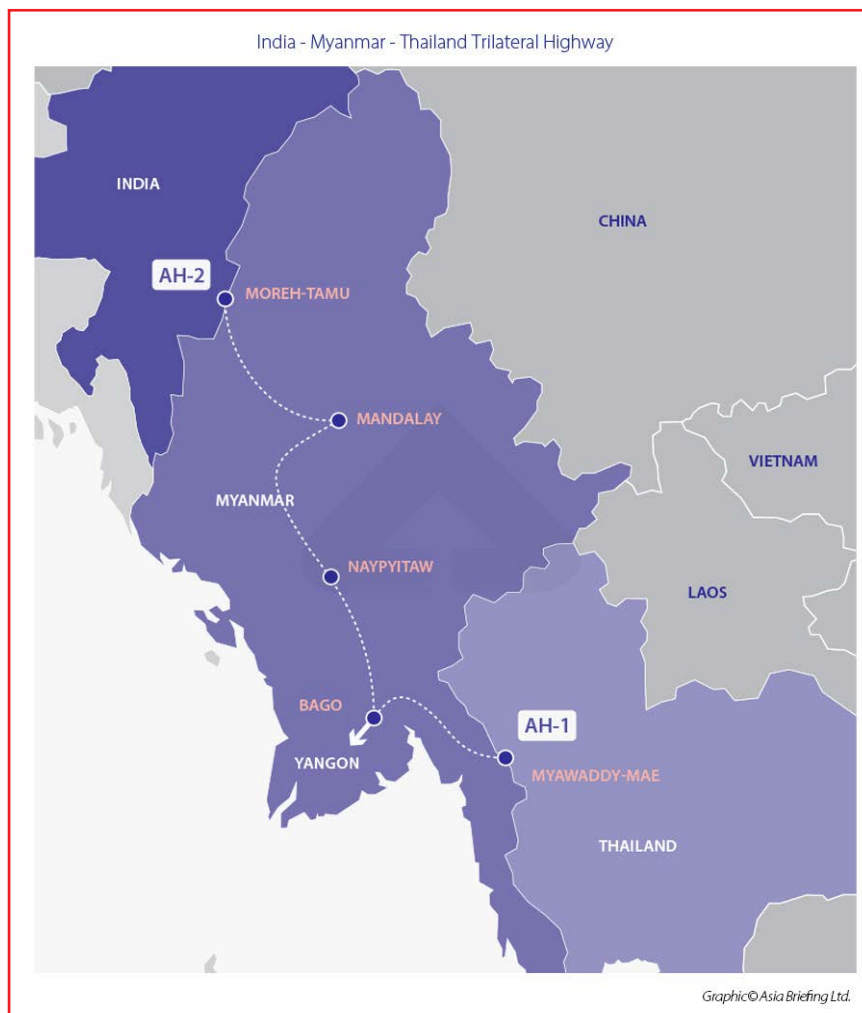
- **About:** India's **AEP** is a strategic initiative aimed at strengthening India's engagement with the countries of **Southeast Asia, East Asia, and the broader Indo-Pacific region**.
 - It evolves from the **Look East Policy, 1992**, focusing on **proactive engagement** to boost economic growth, regional security, and cultural exchanges.

Note:



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- **Strategic Partnerships:** India has upgraded its relations to **strategic partnerships** with several key countries in the region, including **Indonesia, Vietnam, Malaysia, Japan, the Republic of Korea (ROK), Australia, and Singapore.**
- **Regional Engagement:** India is actively involved in the ASEAN Regional Forum (ARF), **East Asia Summit (EAS)**, the **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)**, Asia Cooperation Dialogue (ACD), **Mekong Ganga Cooperation (MGC)**, and **Indian Ocean Rim Association (IORA).**
- **Infrastructure, and Connectivity:** Major infrastructure projects include the **Kaladan Multi-modal Transit Transport Project**, **India-Myanmar-Thailand Trilateral Highway Project**, **Rhi-Tiddim Road Project**, and **Border Haats.**
- **Security Cooperation:** There is a shared commitment between India and ASEAN to upholding international maritime laws and norms and promoting regional stability.
- **Northeast India:** Efforts focus on improving connectivity between **Northeast India and ASEAN** through trade, cultural exchanges, and infrastructure development.
 - **India-Myanmar-Thailand trilateral highway (Asian trilateral highway)** will connect **India (Moreh, Manipur) and Thailand (Mae Sot)** via Myanmar and is planned to be extended to **Cambodia, Laos, and Vietnam.**



2nd India-CARICOM Summit

Why in News?

Recently, the Prime Minister of India chaired the 2nd **India-CARICOM Summit in Georgetown, Guyana**, alongside the Prime Minister of Grenada, the current CARICOM Chair.

- The **first India-CARICOM Summit** was held in **2019 in New York.**

What are the Key Highlights of the 2nd India-CARICOM Summit?

- **7 Pillars of Cooperation:** India's Prime Minister proposed **seven key pillars** to **strengthen ties** between India and 'CARICOM'. These pillars are:
 - **C: Capacity Building:** India announced an additional **1000 ITEC (Indian Technical and Economic Cooperation) slots** for CARICOM countries over the next five years.
 - **A: Agriculture and Food Security:** India shared its experience in agriculture, particularly in the use of technology such as **drones, digital farming, and farm mechanisation.**

Note:

○ **R: Renewable Energy and Climate Change:** India called for greater collaboration on global initiatives like the [International Solar Alliance](#) and [Mission LiFE](#).

○ **I: Innovation, Technology, and Trade:** Prime Minister Modi offered India's [Digital Public Infrastructure](#) and other technological models to improve public service delivery.

○ **C: Cricket and Culture:** India proposed organising “Days of Indian Culture” in CARICOM countries and providing **cricket training** for young women cricketers from the region.

○ **O: Ocean Economy and Maritime Security:** India expressed willingness to collaborate on **maritime domain mapping and hydrography** in the Caribbean Sea.

○ **M: Medicine and Healthcare:** India offered its model for affordable **healthcare**, including the provision of generic medicines through [Jan Aushadhi Kendras](#) and the promotion of **Yoga** for well-being.

➤ **Climate Justice:** CARICOM leaders appreciated India's leadership in championing **climate justice** for [Small Island Developing States \(SIDS\)](#).

○ SIDS are responsible for less than 1% of global greenhouse gas emissions but are among the most affected by climate change impacts.

○ Climate justice means addressing the **unequal and disproportionate impacts** of climate change on different communities, particularly the **poor, marginalised, and vulnerable groups**.

Awards to PM Narendra Modi

- Prime Minister Narendra Modi received top awards from **Guyana and Barbados** during his visit.
 - Guyana conferred the “**Order of Excellence**” and Barbados awarded the “**Honorary Order of Freedom**”.
- Recently, **Dominica** also announced its highest national award, the “**Dominica Award of Honour**,” for PM Modi.
- PM Modi's list of international awards now includes **19 prestigious recognitions**.
 - Notable awards include **Russia's “Order of St. Andrew the Apostle”** and the **US's “Legion of Merit.”**

What is the Caribbean Community (CARICOM)?

- **About:** CARICOM is a grouping of **21 countries: 15 Member States and 6 Associate Members** including both **island states and mainland territories** like Suriname and Guyana.
 - CARICOM was founded in **1973** with the signing of the **Treaty of Chaguaramas** by four founding members of **Barbados, Guyana, Jamaica, and Trinidad and Tobago**.



- **Diversity:** The community is made up of people from **African, Indian, European, Chinese, Portuguese, and Indigenous** backgrounds.
 - **Population:** Approximately **16 million**, with a young demographic, **60% under the age of 30**.

Note:

- **Languages:** The region is multilingual, with **English as the primary language**, alongside **French, Dutch**, and various African and Asian languages.
- **Geographical Spread:** The member states stretch from **The Bahamas** in the north to **Suriname and Guyana** in the south, making it a vast and diverse region with varying levels of economic and social development.
 - They are primarily located in the **Caribbean Sea (Atlantic Ocean)**.
- **Pillars of CARICOM's Integration:** CARICOM's integration is built on **four main pillars**, which guide the objectives of the Community:
 - **Economic Integration:** Enhance development and competitiveness through **trade and productivity**.
 - **Foreign Policy Coordination:** Present a **unified voice** in international diplomacy.
 - **Human and Social Development:** Focus on **health, education, and poverty** alleviation.
 - **Security:** Strengthen regional **security, disaster response**, and crime prevention.



India-CARICOM Relations

- In **November 2003**, a CARICOM delegation visited India, leading to the establishment of a **Standing Joint Commission**.
 - India's High Commissioner in Georgetown (Capital of Guyana) is also accredited as **Ambassador to CARICOM**, highlighting its commitment to regional cooperation.
- **First Meeting of India-CARICOM Foreign Ministers (2005)** laid the groundwork for closer collaboration, particularly in areas like **trade and development** projects through the **Caribbean Development Bank**.

- **First India-CARICOM Joint Commission (2015)** held in Georgetown which led to promotion of **business partnerships** between India and CARICOM countries.
- **India-CARICOM Ministerial Meetings** are held regularly, with notable events occurring on the sidelines of the **UN General Assembly (UNGA)**.
- **Humanitarian Assistance:** In **2017**, after hurricanes in the Caribbean sea, India provided **USD 200,000** in emergency aid and additional support through the **India-UN Partnership Fund for South-South Cooperation**.
- **India-CARICOM Summit (2019)** took place in **New York** on the sidelines of the **UNGA**, saw India offering substantial support to **CARICOM countries**.
 - **USD 14 million Grant:** For community development projects.
 - **USD 150 million Line of Credit:** Specifically for solar energy and climate change projects.
 - **Special Training Programs:** In response to the needs of CARICOM nations, India offered tailored capacity-building programs.
- **India-CARICOM Task Force:** It was established to **reinvigorate cooperation** by streamlining and enhancing ongoing initiatives and establishing clearer strategies for the future.

Why is India and CARICOM Important for Each Other?

- **Strategic Expansion:** The **Latin America and the Caribbean (LAC)** region is diversifying its **geopolitical ties**, seeking new partnerships in Asia, which aligns with **India's ambition** to expand its presence in the region.
- **Shared Climate Concerns:** India and CARICOM face **climate change** impacts, including **rising sea levels** and extreme weather.
 - India's **COP-26 efforts align with CARICOM's call for climate finance** for mitigation and adaptation.
- **International Solar Alliance (ISA):** The ISA, co-founded by India, offers a platform for **CARICOM nations** to enhance solar energy deployment.
 - Additionally, the **One World One Sun One Grid (OWOSOG)** initiative is an innovative approach to creating a **global grid** that could transmit **solar energy across continents**.

Note:

- **Digital Health Collaboration:** India's digital health advancements, like **CoWin** and **National Digital Health Mission (NDHM)**, offer a model for improving healthcare systems in CARICOM, especially for **climate-induced health threats**.
- **Biofuel and Energy Cooperation:** India's collaboration with **Brazil** in biofuel research could be extended to **CARICOM nations**, creating a platform for joint energy solutions and biofuel production.
- **Strengthened Partnerships:** India's Prime Minister's visit and India's ongoing **development assistance** programs, such as the **USD 1 million contribution to the CARICOM Development Fund**, lay a strong foundation for future collaborations.

G20 Rio de Janeiro Leaders' Declaration

Why in News?

Recently, the **G20 Leaders** convened in **Rio de Janeiro, Brazil** for the **19th G20 Summit** reaffirming the **G20's commitment** of advancing a **sustainable and inclusive world** under the theme "**Building a Just World and a Sustainable Planet**."

- Additionally, India's Prime Minister (PM) addressed the G20 session on **Sustainable Development and Energy Transition**.
- **South Africa** will host the **G20 in 2025**, followed by the **United States of America** in **2026**.

What are the Key Outcomes of the G20 Rio de Janeiro Leaders' Declaration?

- **Taxing the Super-Rich:** The declaration advocates for **progressive and effective taxation** of the super-rich.
 - Respect for **fiscal sovereignty** is emphasised while promoting international cooperation on **tax principles**.
- **Multilateralism:** The declaration emphasised better representation of underrepresented regions such as **Africa, Latin America, and Asia-Pacific** in the **UN Security Council**.
 - G20 launched the **Global Alliance against Hunger and Poverty**, targeting **500 million people** with cash transfers and **150 million children** with school meals by **2030**.

- **Social Inclusion and Digital Divide:** Leaders committed to promoting equal participation of both **men and women** in **paid and unpaid care work**, encouraging involvement of both the gender.
 - G20 countries reaffirmed their commitment to **bridge digital divides**, including halving the **gender digital divide** by **2030**.
 - **India, Brazil and South Africa** unveiled a joint declaration on **Digital Public Infrastructure (DPI)** for inclusive digital transformation.
- **Climate Action:** Leaders emphasised **inclusive, technology-neutral** approaches for **low-emission energy**, and welcomed a **Global Climate Change Mobilisation Task Force**.
 - It reaffirmed the G20 ambition to **reduce land degradation** by **50% by 2040** on a voluntary basis, as committed under the **G20 Land Initiative**.
- **Global Trade:** G20 countries agreed to **avoid discriminatory green economic policies**, consistent with **WTO rules** and multilateral environmental agreements.
- **Global Health:** G20 countries welcomed the **Coalition for Local and Regional Production** to enhance equitable access to **vaccines, therapeutics, and health technologies**.

Digital Public Infrastructure

- **About:** Digital public infrastructure (DPI) is a set of **digital systems** that enables countries to **safely and efficiently** provide economic opportunities and deliver social services.
- **Coverage:** DPI spans the **entire economy**, connecting **people, data, and money** in much the same way that **roads and railways** connect people and goods.
- **DPI Ecosystem:** People, data, and money make the foundation of an effective **DPI ecosystem**:
 - First, the flow of people through a **digital ID System**.
 - Second, the flow of money through a **real-time fast payment system**.
 - And third, the flow of personal information through a **consent-based data sharing** system to actualise the benefits of DPIs and to empower the citizen with a real ability to control data.

Note:

Note: Health Ministers from the powerful **G20 nations** have resolved to set up a **Coalition for Local and Regional Production** to promote more equitable access to “safe, affordable, quality and effective health products and technologies”.

G20

Founded in 1999 after Asian financial crisis to discuss global economic and financial issues

No permanent secretariat

Members: 19 countries, The European Union (EU) and The African Union

Permanent Guest: Spain

G20 Summit: Takes place annually

2023 Presidency: India (**Theme:** One Earth, One Family, One Future)

Sherpas: The agenda and work are coordinated by them as the representatives of the G20 countries

Troika: The Presidency is supported by the Troika (previous, current and incoming Presidency)



What are India's Sectoral Progress Highlighted in the G20 Rio Declaration?

- **Inclusivity and SDGs:** Over 4 crore families have received homes, 12 crore homes now have access to clean water, 10 crore families have been provided clean cooking fuel, and over 11.5 crore families have new toilets between 2014 and 2024.
- **Paris Agreement Target:** India is the first G20 country to have fulfilled the commitments made under the **Paris Agreement** ahead of time.

Note:

- India has already achieved its target of **40% installed electric capacity** from **non-fossil fuels** in **November 2021** itself.
- Under India's new target of **500 GW** of renewable energy by **2030**, **200 GW has been achieved**.
- **Green Transition:** India is driving a global green transition with **Mission LiFE** to promote **sustainable lifestyles** and initiatives like **One Sun One World One Grid** and the **International Solar Alliance** to enhance global energy connectivity and expand renewable energy networks.
- **Circular Economy:** India has launched the **Global Biofuel Alliance** and is running a **waste-to-energy campaign** in India aimed at **minimising waste** and making the most of resources.
- **Disaster Resilience:** India has launched the **Coalition for Disaster Resilient Infrastructure**, focusing on both **preemptive measures and post-disaster recovery**, to build **resilient infrastructures** in the face of climate challenges.
- **Support for the Global South:** India recognises the need for affordable and reliable **climate finance** for energy transitions in the Global South, particularly for **Small Island Developing States (SIDS)**.
 - India commits to sharing sustainable development experiences with the **Global South** through **Global Development Compact (GDC)** launched at the **3rd Voice of the Global South Summit 2024**.
 - GDC focuses on **trade, sustainable growth, technology sharing, and concessional financing** within India's growth framework.

What is Significance of G20 in Current Global Order?

- **Global Economic Influence:** The **G20 nations** collectively represent over **85% of global economic output**, around **75% of global exports**, and about **80% of the world's population**.
 - It offers a more **diverse and accurate** representation of the world's economy than older blocs like the G7.
- **Crisis Management:** The G20 was instrumental in responding to the **global financial crisis of 2008-2009**, where its member states agreed to spending measures worth **USD 4 trillion** which helped stabilise the global economy and prevent a deeper recession.

- More recently, the G20's role was crucial in addressing the economic fallout of the **Covid-19 pandemic**.
- **Geopolitical Representation:** It includes influential democratic nations such as **India and Brazil**, as well as autocracies like **China, Russia, and Saudi Arabia** which allows for a **broader perspective** on global issues.
 - The inclusion of the **African Union** brought in voices from a continent with over **1.3 billion people** and an economy worth **USD 3.1 trillion**.
- **Climate Change:** The G20 countries account for **over 80% of global carbon emissions**. This makes the group **indispensable** in any global effort to mitigate climate change.

2nd India-Australia Annual Summit

Why in News?

The Prime Minister of India and the Prime Minister of Australia held the **2nd India-Australia Annual Summit** on the sidelines of the **2024 Group of 20 (G20) Summit in Rio de Janeiro, Brazil**.

- Ahead of the fifth anniversary of the **India-Australia Comprehensive Strategic Partnership** in **2025**, the Prime Ministers highlighted significant progress in areas including climate change, trade, defence, education, and regional cooperation.



What are the Key Highlights of the India-Australia 2nd Annual Summit?

- **Renewable Energy Partnership:** The **India-Australia Renewable Energy Partnership (REP)** was launched to bolster cooperation in **solar energy, green hydrogen**, and energy storage.

Note:

- **Trade and Investments:** Committed to developing a **Comprehensive Economic Cooperation Agreement (CECA)**, building on the success of the **India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA)**, which led to a **40% increase in mutual trade within two years**.
 - The Prime Ministers highlighted the complementarity between **'Make in India'** and **'Future Made in Australia'**, emphasising their potential to create jobs, drive economic growth, and secure future prosperity.
 - Both Nations welcomed the extension of the **Australia-India Business Exchange (AIBX) programme** for another four years from July 2024.
 - The AIBX is a **4-year program aimed at boosting trade and investment between India and Australia** by providing market insights and fostering commercial partnerships.
- **Enhanced Mobility:** Both nations recognized mobility between Australia and India as key to economic growth, they welcomed the launch of **Australia's Working Holiday Maker visa programme** for India in October 2024.
 - They also looked forward to the commencement of **Australia's Mobility Arrangement for Talented Early-professionals Scheme (MATES)**, aimed at promoting mobility of early professionals and providing Australian industry access to India's top **STEM (science, technology, engineering, and mathematics) graduates**.
- **Strategic Collaboration:** The leaders agreed to renew the **Joint Declaration on Defence and Security Cooperation (JDSC) in 2025**, reflecting their enhanced defence partnership and strategic convergence.
 - The JDSC, agreed in 2007, aimed to strengthen cooperation in areas such as **counter-terrorism, disarmament, non-proliferation, and maritime security**.
- **Regional and Multilateral Cooperation:** Both nations reiterated their support for a free, open, and inclusive **Indo-Pacific**, consistent with the **United Nations Convention on the Law of the Sea (UNCLOS)**.
 - They pledged continued collaboration under the **Quad framework**, emphasizing areas like pandemic response, **cybersecurity**, and critical infrastructure.

- The **2024 Indian Ocean Conference in Perth** and India's upcoming **Indian Ocean Rim Association (IORA) Chairmanship in 2025** underscore mutual efforts in maritime ecology and sustainable development.
- Both nations reaffirmed commitments to supporting Pacific island countries through **Forum for India-Pacific Islands Cooperation (FIPIC) framework**.

Note: The 1st Annual Summit was held in **2023** in New Delhi, the Prime Ministers reaffirmed their support for strengthening the **India-Australia Comprehensive Strategic Partnership**.

What is the India-Australia Comprehensive Strategic Partnership?

- **About:** In June 2020, India and Australia elevated their relationship from a **'Strategic Partnership' signed in 2009** to a **'Comprehensive Strategic Partnership' (CSP) to strengthen bilateral ties**.
 - It is grounded in mutual trust, shared democratic values, and common interests in areas like regional security, economic growth, and global cooperation.
- **Key Features of the CSP:**
 - **Science, Technology & Research Collaboration:** Enhanced cooperation on medical research, technology, and cyber security.
 - **Maritime Cooperation:** Joint efforts to ensure a free, open, and inclusive Indo-Pacific, with a focus on sustainable maritime resources and combating illegal fishing.
 - **Defence:** Expanding military cooperation by conducting joint exercises like the **"Malabar" exercise** and providing logistics support through agreements such as the **Mutual Logistics Support Agreement (MLSA)** to address common security challenges.
 - **Economic Cooperation:** Re-engaging on a **Comprehensive Economic Cooperation Agreement (CECA)**, encouraging trade, investment, and collaboration in infrastructure, education, and innovation.
- **Implementation:** The CSP includes regular dialogues at various levels, including **foreign and defence ministers meeting in a '2+2' format**. Annual summits and ministerial meetings are intended to ensure continued cooperation.

Note:

Ind-Aus ECTA

- The Ind-Aus ECTA signed in 2022, aimed to boost trade between the two nations. It granted **India preferential access to 100% of Australia's tariff lines**, covering key sectors like gems, textiles, leather, and agriculture.
- In return, **India offered preferential access to over 70% of its tariff lines**, including raw materials like coal and minerals, benefiting both countries' trade interests.

What are the Key Milestones in India-Australia Relations?

- **Bilateral Trade:** India is Australia's **5th largest trading partner** with two-way trade in goods and services valued at USD 49.1 billion in 2023.
 - **India's Exports to Australia:** Refined petroleum, Pearls and gems, Jewellery, and Made-up textile articles.
 - **Australia's Exports to India:** Coal, Copper ores and concentrates, Natural gas, Non-ferrous/Ferrous waste and scrap, and Education-related services.
- **Civil Nuclear Cooperation:** In 2014, India and Australia signed the **Civil Nuclear Cooperation Agreement**, allowing **uranium exports to India**.
 - The agreement came into force in 2015, facilitating the supply of uranium for India's peaceful nuclear energy needs.
- **Defence and Security Cooperation:** India-Australia defence ties are strengthened through joint exercises like **AUSINDEX**, **Pitch Black**, and initiatives like the **2022 General Rawat Exchange Programme**, a military exchange program.
 - India and Australia have signed an agreement allowing the **Royal Australian Air Force (RAAF)** to **refuel Indian aircraft near Australian airspace**. This aims to enhance interoperability and **boost operational reach in the Indo-Pacific region**.
 - Under this agreement, the **RAAF's KC-30A will refuel India's P-8I surveillance aircraft**, strengthening defence ties and regional security.
- **Multilateral Engagement:** Active participation in Quad initiatives, IORA, and the **International Solar Alliance (ISA)**.

- Australia supports India's candidature for a permanent seat in the **United Nation Security Council** and membership in the **Asia-Pacific Economic Cooperation**.

PM's Visit to Nigeria, Brazil and Guyana

Why in News?

Recently, the **Prime Minister** of India has commenced a significant three-nation visit to **Nigeria** (Africa), **Brazil**, and **Guyana** in South America.

- Following his visit to Nigeria, the PM travelled to Brazil to participate in the 19th **G20 Summit** and subsequently proceeded to Guyana.

What are the Key Highlights of India-Nigeria Relations?

Recent Diplomatic Engagement:

- The recent visit by the Indian **Prime Minister (PM)** to Nigeria in November 2024 marked a significant moment in bilateral relations, being the **first visit by an Indian prime minister in 17 years**.
 - During this visit, his reception included the **conferral of Nigeria's second-highest national award**, the **Grand Commander of the Order of Niger**.

India-Nigeria Relations:

- **Historical Ties:** India established its diplomatic presence in Lagos in **1958**, just two years before Nigeria **gained independence from British colonial rule in 1960**, marking the beginning of their bilateral relationship.
 - In 2007, both nations elevated their relationship to a **"Strategic Partnership"**.
- **Cultural and Educational Exchange:** India has played a significant role in Nigeria's development, especially in the fields of **education and healthcare**.
 - India established the **National Defence Academy** in **Kaduna** and the **Naval War College in Port Harcourt**, contributing to Nigeria's military training and capacity-building.
- **Economic Engagement:** India-Nigeria economic ties hold significant importance, with over 200

Note:



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Indian companies investing approximately **USD 27 billion** across key sectors such as **manufacturing, telecommunications, and pharmaceuticals**.

- This robust partnership positions India as the **second-largest employer in Nigeria** after the Federal Government.
- **Developmental Assistance:** India has positioned itself as a key development partner for Nigeria, offering developmental assistance through **concessional loans** totalling USD 100 million.
 - This assistance reflects India's commitment to supporting Nigeria's **socio-economic development** and aligns with India's broader vision of fostering growth in the **Global South**.
- **Regional Influence:** Nigeria, known as the "**Giant of Africa**," has Africa's **largest population (~220 million)** and the **largest economy** in the continent.
 - As a founding member of the **African Union (AU)**, Nigeria plays a pivotal role in African politics and regional stability.
- **Strategic Interests:** India seeks stronger ties with Nigeria to **counter China's growing influence**, as China has become Africa's largest trading partner over the past two decades.
 - **India acknowledges Africa's wealth of critical minerals**, which are essential for industries like **electric vehicles** and vital for India's economic goals.
- **Focus on Common Challenges:** Both nations share common challenges such as **terrorism, separatism, piracy, and drug trafficking**.
- **Cultural Significance:** The relationship is enriched by a **large Indian expatriate (about 60,000)** community in Nigeria, which is the **largest in West Africa**.
 - This fosters **cultural ties and economic collaboration** through cultural exchanges, educational initiatives, and people-to-people interactions.
- **Opportunities in India-Nigeria Relations:**
 - **Healthcare Cooperation:** India is the leading destination for Nigerian **medical tourists**, with affordable and quality healthcare services.
 - **Defence Collaboration:** Nigeria seeks enhanced defence cooperation with India in areas like **training, equipment supply, and counter-insurgency**

strategies, particularly to combat groups like **Boko Haram**.

- **Business and Economic Cooperation:** To boost trade and investment, forming an **India-Nigeria Business Council** with leading business houses from both countries could help identify and develop new opportunities.

Nigeria	
➤	Location: Western coast of Africa, often called the "Giant of Africa."
○	Borders: North – Niger, East – Chad and Cameroon, South – Gulf of Guinea, West – Benin.
➤	Independence: Gained independence from Britain in 1960.
➤	Official Language: English; local languages include Hausa, Yoruba, Igbo, and Ijaw.
➤	Geography: Diverse, with climates ranging from arid to humid equatorial.
○	Drainage: Major basins include Niger-Benue, Lake Chad, and Gulf of Guinea. The Niger River and its largest tributary, the Benue River, are principal rivers.



What are the Key Highlights of India-Brazil Relations?

- **Recent Diplomatic Engagement:**
 - India and Brazil held bilateral discussions on the sidelines of the **19th G20 Summit** in Rio de Janeiro, Brazil.

Note:

- Both nations focused on strengthening cooperation in sectors such as **energy, biofuels, defence, agriculture, healthcare, and digital technology.**
- India expressed strong support for Brazil's '**Global Alliance against Hunger and Poverty**' initiative and appreciated Brazil's leadership during its **G20** Presidency.
- Brazil emphasised the urgency of addressing **global climate challenges**, calling for **decisive action** at **UNFCCC COP29** climate talks in **Azerbaijan**, ahead of the **COP30 summit** in **Belem, Brazil**, in **2025**.
 - Brazil supports India's candidature for a **non-permanent seat** of the **UNSC** for the 2028-2029 term.

➤ India-Brazil Relations:

○ Institutional Engagements:

- India and Brazil share a robust and multifaceted relationship, marked by collaborations at bilateral and multilateral levels through platforms such as **BRICS, IBSA, G4, G20, BASIC, International Solar Alliance (ISA), WTO, UNESCO, and WIPO.**
- Institutional mechanisms like the Strategic Dialogue led by **National Security Advisors (NSA)**, **India-Brazil Business Leaders Forum**, **Economic and Financial Dialogue**, and **Joint Committee on Science & Technology** foster collaboration on trade, defence, science, and economic policy.

○ Trade and Investment:

- Bilateral trade between the **two nations** reached **USD 15.2 billion** in **2022**.
- In **2021**, India became the **5th largest trading partner** of **Brazil** with investments spanning sectors such as **automobiles, IT, mining, energy, and biofuels.**
- The **Preferential Trade Agreement (PTA)** signed with **MERCOSUR (Brazil, Argentina, Uruguay, Paraguay)** in **2004** further strengthens economic ties.

○ Defence Cooperation:

- Defence cooperation is anchored by a **2003 agreement** and institutionalised through **Joint Defence Committee (JDC)** meetings.
- **Strategic Dialogue** addresses defence and global issues, while a **2020 MoU on Cyber Security** with **CERT-In** highlights cyber cooperation.

○ Energy Security:

- Energy security is a vital area, with a **2020 MoU** between **Indian Oil Corporation** and **Brazil's CNPEM** promoting **bioenergy research.**
- Both countries, along with the US, launched the **Global Biofuel Alliance (GBA)** during the **G20** summit in **2023** to enhance **biofuel production** and demand.
- Brazil's expertise in **ethanol production** supports **India's Ethanol Blending Programme**, with **Brazil** achieving a **27% blend** and **India** targeting **20% by 2025-26**, building on its current **15.83%.**



What are the Key Areas of Engagement Between India and Guyana?

➤ Recent Diplomatic Engagement:

- The PM's recent visit to Guyana, **the first in 56 years**, shows India's renewed interest in the Caribbean and Latin America, **supported by historical ties** with the Indian diaspora and Guyana's growing oil sector.

➤ India-Guyana Relations:

○ Historical and Diplomatic Ties:

- India established its **diplomatic presence** in **Guyana** with the Commission of India in **1965**, upgraded to a full-fledged High Commission in **1968**.

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- Guyana reciprocated by **reopening its mission in India in 2004** after economic constraints led to its closure in 1990.
- **Development Cooperation and Technical Assistance:**
 - India provides developmental support through the **Indian Technical and Economic Cooperation (ITEC)** program, offering **scholarships in diverse fields**.
 - The ICCR scholarship program also facilitates academic exchange, with over 600 Guyanese scholars trained under these schemes.
- **Economic and Trade Relations:**
 - Indian companies are **exploring opportunities in biofuel, energy, minerals, and pharmaceuticals**.
 - The **Joint Business Council** between **FICCI** and the **Georgetown Chamber of Commerce** facilitates economic cooperation.
 - Guyana has engaged actively with India in **renewable energy projects**, particularly under the **International Solar Alliance (ISA)**. Bilateral collaboration extends to **solar energy, biofuels, and sustainable development** initiatives.
- **Cultural and People-to-People Ties:**
 - Guyana, with a population where approximately **43.5% are of Indian origin**, represents one of the **oldest Indian diasporas**, having migrated over 185 years ago.
 - Cricket serves as a unifying force, with Guyanese players participating in the **Indian Premier League (IPL)**.
 - **Ayurveda and yoga** are gaining popularity, further enhancing cultural connections.
- **Competition from China:**
 - India's efforts to strengthen ties with Guyana face **competition from China**, which has a significant presence through **Belt and Road Initiative (BRI)** projects.
 - While **India committed USD 100 million** to a road project in Georgetown, China's larger investments dominate, despite mixed local sentiments about Chinese practices and benefits.

■■■

Guyana

- **Capital:** Georgetown
- **Colonised by the UK:** Guyana gained **independence from the United Kingdom (UK) in 1966** and became a republic in 1970.
- **Geography:** Located on the northern coast of South America, bordered by Venezuela, Brazil, and Suriname, with the Atlantic Ocean to the north.
 - **Major Rivers:** Essequibo River (largest), Demerara River, and Berbice River.
 - **Mountains:** Pakaraima Mountains, Kanuku Mountains, Acarai Mountains.



PM Received Top National Awards from Guyana, Barbados and Dominica

- The PM of India received the **highest national honours** from **Guyana (Order of Excellence)**, **Barbados (Honorary Order of Freedom of Barbados)** and **Dominica (Dominica Award of Honour)**.
 - PM was conferred with Dominica's highest National Award for his **statesmanship, support to Dominica** during the **Covid-19** pandemic, and commitment to **strengthening India-Dominica ties**.
- With these awards, PM international recognition tally now stands at 19.

Note:

Social Issues

Highlights

- Deletion of MGNREGA Job Cards
- State of Undertrial Prisoners in India
- SC Calls for Reform to Empower Women Leaders
- Femicides in 2023: Global Estimates of Intimate Partner/Family Member Femicides Report
- GQ-RCP Platform for HIV Detection
- The State of the World's Children 2024
- Tribal Development Approaches
- Global Alliance Against Hunger and Poverty

Deletion of MGNREGA Job Cards

Why in News?

The recent surge in the **deletion of workers from job cards** under the **Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA)** has raised serious concerns about the right to work and transparency in implementation.

- In **2022-23** alone, **over 5.53 crore workers** were removed, marking a **247% increase from 2021-22**.

What are the Key Provisions For Deletion of MGNREGA Job Cards?

- **Grounds for Deletion:** As per **Schedule II, Paragraph 23** of the MGNREGA Act, 2005, a job card can only be **deleted under specific, well-defined conditions**:
 - **Permanent Migration:** If a household **permanently relocates** from the concerned **Gram Panchayat**.
 - **Duplicate Job Cards:** If a job card is found to be a **duplicate**.
 - **Forged Documents:** If a job card was issued based on **forged documents**.
 - **Reclassification of Area:** If a Gram Panchayat is reclassified as a **Municipal Corporation**, all associated **job cards** are deleted.
 - **Other Valid Reasons:** The MGNREGA **Management Information System (MIS)** lists reasons like **"Duplicate Applicant," "Fake Applicant,"** and **"Not Willing to Work."**

- **Role of ABPS:** The surge in **MGNREGA job card deletions** during **2022-23** coincided with the implementation of mandatory **Aadhaar-based payment systems (ABPS)** which required workers to link their Aadhaar numbers to their job cards.

- Workers with **non-linked or improperly linked** Aadhaar led to job card deletions.

- **Due Process for Deletion:** Workers proposed for deletion **must be heard** with two independent persons present, **reasons for deletion independently verified**, actions **documented**, and reports **shared** with the **Gram Sabha or Ward Sabha** for transparency.

Note: ABPS is a payment system that uses **Aadhaar numbers** to electronically send **government subsidies and benefits** to the **Aadhaar-linked bank accounts** of beneficiaries.

What are the Implications of Deletion of MGNREGA Job Cards?

- **Violation of the Right to Work:** Deleting workers' names from job cards on grounds of "not willing to work", denies the worker his **legal right to work**.
 - Many workers labeled as "Not willing to work" **actually worked or requested work** in the same financial year of their deletion.
- **Inconsistent Procedure:** The official reason of **"Village becomes urban,"** used for deleting job cards of **only some workers** contradicts the Act's stipulation that **all job cards** in an **urbanized area** must be deleted.
 - Deletions often **bypass Gram Sabha** approval, violating the Act, and many workers face **wrongful deletions without their knowledge**.

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- **Absence of Verification:** Many workers were victims of **wrongful deletions** when deletion was done **without any verification or analysis** to assess the validity of reasons for deletion.
 - While deletions are **recorded in the MIS**, the Ministry of Rural Development has **not conducted any verification and analysis** of deletion reasons, including the 'Not willing to work' reason.
- **Impact on Vulnerable Populations:** Deleting workers for reasons such as **"not willing to work"**, especially in light of **high rural unemployment rates**, directly undermines their livelihood opportunities.
- **Data-Driven Concerns:** The data indicates that the surge in deletions **aligns** with the increased focus on **ABPS**, suggesting that deletions may have been driven by **compliance incentives** rather than genuine reasons.

What is MGNREGA Scheme?

- **About:** Mahatma Gandhi National Rural Employment Guarantee Act, 2005 passed in September 2005 to provide a **legal guarantee for wage employment** under the **MGNREGA Scheme**.
- **Objective:** To enhance livelihood security in rural areas by offering **100 days of wage employment per financial year** to **adult members of rural households** willing to do **unskilled manual labor**.
- **Eligibility:**
 - **Target Group:** All rural households in need of employment and willing to do **manual, unskilled work**.
 - **Registration:** Applicants submit their requests to the **Gram Panchayat**, which registers households and issues job cards after verification.
 - **Priority:** At least **one-third** of the wage seekers should be **women**.
 - **Employment Conditions:** Employment should last at **least 14 consecutive days**, with no more than six workdays per week.
- **Employment Provision:**
 - **Employment Timeline:** The **Gram Panchayat or Block Programme Officer** must provide work within **15 days of application**, ideally within **5 kilometers** of the applicant's village.
 - Work beyond this requires an **extra 10% wage for transportation** and living costs.

- **Unemployment Allowance:** If employment is **not provided within 15 days**, an **unemployment allowance** is given which is **one-fourth of the wage rate** for the **first 30 days** and at least half for the rest.
- **Permissible Works:**
 - **Water and Land Development:** Conservation and harvesting.
 - **Afforestation and Drought Proofing:** Tree plantation.
 - **Irrigation and Farm Infrastructure:** Canals, ponds, and irrigation.
 - **Rural Connectivity:** Roads and culverts.
 - **Sanitation and Hygiene:** Latrines and waste management.
 - **Rural Infrastructure:** Community centers and storage.
 - **Employment-Linked Projects:** Composting, livestock shelters, fisheries.
- **Restrictions:** The use of **contractors** and **labor-displacing machines** is **prohibited**.

MGNREGA and SDGs:



State of Undertrial Prisoners in India

Why in News?

Recently, the Union Home Minister emphasized the need for expediting the release of undertrial prisoners

Note:

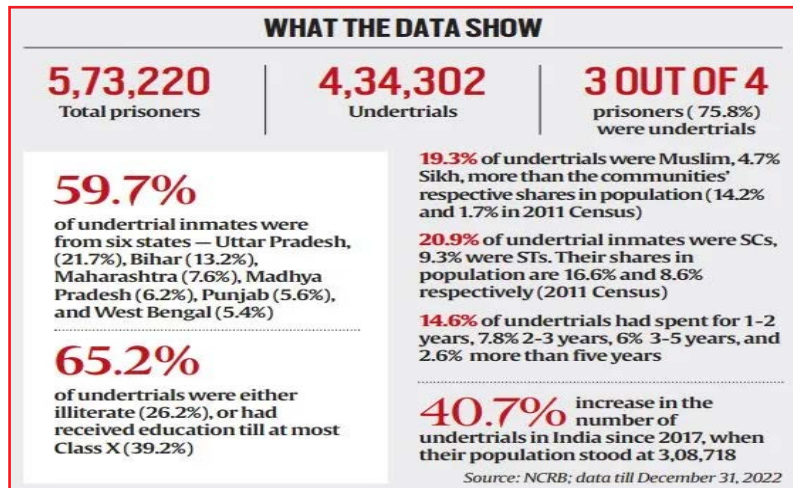
who have served **more than one-third of their maximum sentence by 26th November (Constitution Day)**.

- The initiative also aligns with the recently enacted **Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023**, which introduces provisions for relaxed bail for **first-time offenders**.

Note: An **undertrial prisoner** is an individual **who is in custody while awaiting trial or the conclusion of legal proceedings** against them. This category includes those who have not yet been convicted of a crime and are held in judicial custody during the legal process.

What is the Current State of Undertrial Prisoners in India?

- **High Proportion of Undertrials:** As per the **Prison Statistics India 2022** report by the **National Crime Records Bureau (NCRB)** undertrials constitute **75.8% of India's prison population** (4,34,302 out of 5,73,220).
 - Among the **23,772 incarcerated women, 76.33% are undertrials**, and **8.6% of all undertrials** have been in prison for over three years.
- **Overcrowding:** According to a report by the **Supreme Court's Centre for Research and Planning**, Indian prisons operate at **131% occupancy**, housing **573,220 inmates** against a capacity of **436,266**.
 - Notably, **75.7% of these inmates are undertrials**, reflecting a substantial judicial backlog.
- **Lack of Legal Representation:** Despite **Article 39A** guaranteeing **free legal aid**, many undertrial prisoners lack access to legal representation due to an insufficient lawyer-to-prisoner ratio, hindering their ability to defend themselves effectively.



What are the Provisions Related to Undertrial Prisoners in India?

- **Section 479 of BNSS:** Aims to reduce prolonged detention, focusing on first-time offenders.
 - **Relaxed Standards for First-Time Offenders:** First-time offenders, defined as those **without prior convictions**, must be released on

bond after serving one-third of the maximum sentence.

- **General Rule for Bail:** Undertrials accused of non-capital offenses (not punishable by death or life imprisonment) are eligible for bail after serving half of the maximum sentence.
 - Builds upon **Section 436A of the CrPC**, which similarly allowed release after serving half the sentence.
- **Exceptions:** Provisions do not apply to cases involving multiple offenses or ongoing investigations for other crimes.
- **Section 436A of CrPC:**
 - **Eligibility for Bail:** Undertrials who have served half of the maximum imprisonment period for their alleged offense **can be released on personal bond (with or without sureties)**.
 - **Exclusion:** Does not apply to offenses punishable by death or life imprisonment.
- **Directions by the Judiciary:**
 - **Supreme Court's PIL on Prison Conditions (2013):** In *Re: Inhuman Conditions in 1382 Prisons*, the Court highlighted issues like overcrowding, delayed trials, and prolonged detention of undertrials.
 - It directed state governments to ensure timely identification and release of eligible undertrials under **Section 436A CrPC**.
 - **Retrospective Application of Section 479 of BNSS:** The Supreme Court ruled that the relaxed bail provisions under BNSS would apply retrospectively to cases filed before its enactment.
 - The court has emphasized that speedy trial is a **fundamental right** under **Article 21 of the Constitution**, and any unjustified delay in trial could lead to bail being granted.

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What are the Implications of the Undertrial Crisis in India?

- **Violation of Fundamental Rights:** Prolonged detention without trial infringes upon several fundamental rights guaranteed by the Indian Constitution, including the right to a **speedy trial (Article 21)** and the presumption of innocence until proven guilty (**Article 20(3)**).
- **Judicial Backlog:** The high number of undertrial prisoners contributes significantly to the backlog of cases in the Indian judicial system. This backlog delays justice for all individuals and undermines public trust in the legal system.
- **Impact of Delayed Justice:** Prolonged detention affects access to justice, rehabilitation, and the socio-economic well-being of undertrial prisoners and their families.
 - Prison overcrowding often leads to **inhumane living conditions, compounding health and psychological challenges**.
- **Mental Health Issues:** Long periods of incarceration without conviction can lead to severe psychological distress among undertrials, including anxiety, depression, and a sense of hopelessness.
- **Erosion of Trust:** The high number of undertrials and the resulting delays erode public confidence in the legal system. When justice is delayed or denied, citizens may lose faith in the ability of the legal system to provide timely and fair outcomes.

How Prisons are Regulated in India?

- **Constitutional Provisions:**
 - **Article 21:** It protects prisoners against torture and inhuman treatment. It also ensures timely trials for prisoners.
 - **Article 22:** An arrested person must be promptly informed of the reasons for their arrest and has the right to consult and be defended by a lawyer of their choice.
 - **Article 39A:** Ensures **free legal aid** to ensure justice for those unable to afford legal representation
- **Legal Framework:**
 - **Prisons Act, 1894:** The Prisons Act, enacted during British rule, serves as the foundational legal framework for prison management in India.

- It focuses on the custody and discipline of prisoners but lacks provisions for rehabilitation and reform.

- **The Identification of Prisoners Act, 1920:** This law governs the identification process for prisoners and the collection of biometric data.
- **The Transfer of Prisoners Act, 1950:** It provides guidelines for the transfer of prisoners between different states and jurisdictions.

➤ Oversight Mechanisms :

- **Judicial Oversight:** The Indian judiciary plays a critical role in overseeing prison conditions through Public Interest Litigations (PILs) and specific cases addressing inmate rights.
 - For instance, the Supreme Court in *D.K. Basu vs. State of West Bengal (1997)*, mandated strict protocols for arrest and detention.

What are the Initiatives Related to Prison Reforms in India?

- **Modernization of Prisons Scheme:** The scheme for modernisation of prisons was launched in 2002-03 with the objective of improving the condition of prisons, prisoners and prison personnel.
- **Modernisation of Prisons Project (2021-26):** Government has decided to provide financial assistance to States and UTs, through the Project for using modern-day security equipment in Prisons for enhancing the security of jails and to facilitate the task of reformation and rehabilitation of prisoners through correctional administration programmes.
- **E-Prisons Project:** The E-Prisons project aims to introduce efficiency in prison management through digitization.
- **Model Prison Manual Act, 2016:** The manual provides detailed information about the legal services (including free services) available to prison inmates.
- **National Legal Services Authority (NALSA):** It was constituted under the Legal Services Authorities Act, 1987 which came into force on 9th November, 1995 to establish a nationwide uniform network for providing free and competent legal services to the weaker sections of the society.

Note:

SC Calls for Reform to Empower Women Leaders

The **Supreme Court (SC) of India** has called for governance reforms to **empower female elected representatives** and protect their autonomy. It highlighted **systemic gender bias, bureaucratic overreach, and discriminatory practices** that undermine women in leadership roles.

- SC urges for introspection and structural changes to promote gender equality in governance.

What are the Challenges Faced by Women Leaders in Governance?

- **Systemic Discrimination:** **Elected Women Representatives (EWRs) of India's Panchayati Raj Institutions (PRIs)** are often treated as subordinates to bureaucrats, who frequently ignore their legitimacy.
 - Bureaucrats may overstep their roles, making **unilateral decisions** without consulting elected representatives, thereby undermining the democratic process.
 - This power imbalance stifles the decision-making capabilities of elected representatives, particularly women.
- **Sarpanch-Patism:** Also known as **pradhan-pati**, practice where **husbands of elected women panchayat leaders exercise power**, undermining women's autonomy and leadership. This reinforces **patriarchy** and weakens the intent of the **73rd Constitutional Amendment** (women's reservation in panchayats) to empower women.
- Also known as **pradhan-pati**, it is a practice observed in panchayats where **men often exercise actual political and decision-making power** while elected women representatives hold the title of **sarpanch or pradhan**, leading to a lack of autonomy for female leaders.
- **Political Barriers:** Women leaders often face **limited financial support** and fewer **political connections** compared to their male counterparts.
 - Political parties may allocate fewer resources to female candidates, making it more difficult for them to **run for office and gain recognition**.

- Additionally, most female leaders in PRIs hold office for only a single term due to limited resources, which hinders their ability to participate again.
- **Violence and Intimidation:** Female leaders may face **threats, harassment, and violence**, which can prevent them from fully engaging in their roles.
 - Administrative authorities and panchayat members often team up to take revenge against female leaders.
- **Neglect of Principles of Natural Justice:** The removal of elected female representatives undermines democratic norms and fairness by denying them a **fair hearing and making opaque decisions**, perpetuating discrimination and biased practices in governance.
- **Structural Barriers:** Delayed work orders and procedural hurdles obstruct women's developmental initiatives, discouraging their participation in governance.

What is the Role of Women in Governance?

- **Promotes Gender Equality:** Women's participation in governance addresses long-standing gender disparities, promoting equality in decision-making processes.
 - It challenges societal norms that limit **women's roles to the private sphere**, ensuring representation in public and political domains.
- **Enhances Policy Outcomes:** Women bring diverse perspectives rooted in their lived experiences, leading to more comprehensive and empathetic policymaking.
 - For instance, EWRs in Rajasthan have been actively promoting environmental sustainability through initiatives aligned with the **Swachh Bharat Abhiyan** and efforts to **curb plastic usage**, contributing to a cleaner and greener future.
 - Women leaders are often **perceived as less corrupt** and more committed to their responsibilities, fostering transparency and **trust in public administration**.
 - Their inclusion ensures the formulation of **gender-sensitive policies**, addressing issues like **maternal health, workplace equity, and education**.

Note:



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- **Encourages Grassroots Participation:** Women's involvement in local governance inspires other women to participate, creating a **ripple effect of empowerment**. This involvement also assists in the growth of **Self-Help Groups (SHGs)**, thereby improving livelihoods.
 - India's above 44% participation of EWRs in local governance demonstrates the success of seat reservations and women-centric policies.
- **Addresses Gender-Based Violence:** Women leaders play a critical role in addressing **domestic violence**, **child marriage**, and other gender-based issues.
 - **For instance**, according to the Ministry of Women and Child Development **2 lakh child marriages were prevented in 2023**. EWRs were found to have intervened to stop abuse reported by women in their constituencies.
- **Supports Democratic Values:** Women's involvement strengthens democratic principles by ensuring that half the population has a **voice in policy-making**. It upholds social justice and the **right to equal representation in political processes**.

Women's Representation in India's Governance

- **Parliament:** In the **Lok Sabha**, women's representation has risen from 5-10% until 2004 to 13.6% in the 18th Lok Sabha (2024- Present), while in the **Rajya Sabha**, it stands at 13%.
 - The number of women contesting elections has increased significantly, **from 45 women candidates in 1957 to 799 (9.5% of total candidates) in 2024**.
- **State Legislatures:** The national average of **women's representation in State Legislative Assemblies** is just **9%**, with no state exceeding 20% female legislators. Chhattisgarh has the highest at 18%.
- **Panchayati Raj Institution:** According to a 2024 report by the **Reserve Bank of India (RBI)**, 45.6% of the total representatives of PRIs are EWRs.
- **Urban Local Bodies:** In India, 46% of councillors are women, with over 60% in 19 of 21 capital cities with active urban local bodies.

- **Global Scenario:** India ranks **143 out of 185 countries** in terms of women's representation in the lower house of Parliament.

What are India's Efforts to Promote Women in Governance?

- **Reservation in Panchayats:** The **73rd Constitutional Amendment Act of 1992** mandates that one-third of the seats in **Panchayats (local government bodies)** are reserved for women, including the positions of chairpersons.
- **Reservation in Urban Local Bodies:** Similar to the Panchayats, the **74th Constitutional Amendment Act of 1992** ensures one-third reservation for women in **urban local bodies**, such as municipalities.
- **Women's Reservation Act, 2023:** The legislation under the **106th Constitutional Amendment (2023)** mandates the reservation of one-third of all seats in the Lok Sabha, and state legislative assemblies for women.
 - The reservation will be implemented after the **first census** following the commencement of the **106th Amendment Act** including a **delimitation exercise**.
- **National Commission for Women (NCW):** Established in 1992, the **NCW** works to protect and promote the interests of women, including those in governance roles.
- **Supportive Legislation:** Laws such as the **Protection of Women from Domestic Violence Act, 2005**, and the **Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013**, provide a safer environment for women to participate in governance.
- **Initiatives:**
 - **Rashtriya Gram Swaraj Abhiyan (RGSA):** Launched in 2018, **RGSA** aims to strengthen PRIs' capacity for responsive rural governance, using technology and resources to promote sustainable solutions and incentivize women's participation.
 - **Gram Panchayat Development Plan (GPDP):** **GPDP guidelines** promote women's empowerment through active participation in budgeting, planning, implementation, and monitoring, including **Mahila Sabhas before Gram Sabhas**.

Note:



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WOMEN Reservation Act, 2023

(106th Constitutional Amendment Act)

OBJECTIVE

- Reserve 1/3rd of total seats in LS and state Legislative Assemblies (LAs) for women

BACKGROUND

- Bill previously introduced in: 1996, 1998, 2009, 2010, 2014
- Related Committees:
 - » Committee on the Status of Women in India (1971)
 - » Committee under Margaret Alva (1987)
 - » Geeta Mukherjee Committee (1996)
 - » Committee on the Status of Women (2013)

Key Features

Articles Inserted:

- Article 330A - Reservation for Women in LS
- Article 332A - Reservation for Women in State LAs
- Article 239AA - Reservation for Women in NCT of Delhi
- Article 334A - Reservations to become effective after delimitation is undertaken and Census is conducted

Time Period:

- Reservation to be provided for **15 years** (can be extended)

Rotation of Seats Reserved:

- After each delimitation

NEED

- Political Underrepresentation:
 - » Only **82 Women MPs in LS (15.2%)** and 31 in RS (13%)
 - » On avg, women constitute only **9% of the total members in State LAs**



ARGUMENTS

In Favour:

- » Vital step towards gender equality
- » Broader range of perspectives to the decision-making process
- » Helps eliminate discrimination against women in political/public life

Against:

- » Delimitation based on 2021 census (yet to be conducted) is mandatory
- » No women's reservation in RS and State Legislative Councils

STEPS AHEAD

- Reservation for women within political parties
- Independent political decision-making by women; overcoming Sarpanch-patrim



Note:

Femicides in 2023: Global Estimates of Intimate Partner/Family Member Femicides Report

Why in News?

Recently, the **Femicides in 2023: Global Estimates of Intimate Partner/Family Member Femicides** report was on the **International Day for the Elimination of Violence against Women** (25th November).

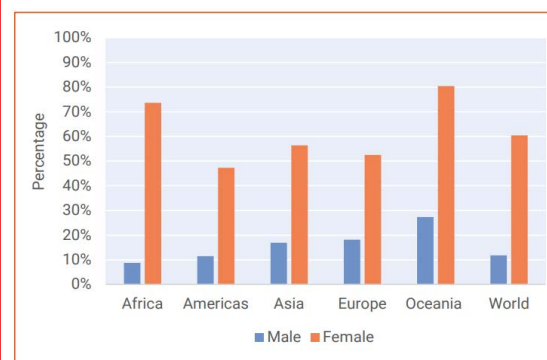
- It was released by **UN Women** and the **United Nations Office on Drugs and Crime (UNODC)** highlighting the severity of the **global crisis of femicide**.
- Femicide is defined as an intentional killing with a gender-related motivation. It is driven by discrimination against women and girls, unequal power relations, gender stereotypes or harmful social norms.
 - It is different from homicide, where the motivation may not be gender-related.

What are the Key Findings of the Report?

- **Global Scenario:** In 2023, **85,000 women and girls** were intentionally killed worldwide, with **60% (approximately 51,100)** killed by intimate partners or family members.
 - On average, **140 women and girls per day** were victims of femicide by intimate partners or close relatives.
- **Regional Disparities:** **Africa** reported the highest number of **victims (21,700)** and the highest rate of femicide per population (**2.9 per 100,000**).
 - The **Americas and Oceania** followed, with rates of **1.6 and 1.5 per 100,000**, respectively, while **Asia and Europe** reported significantly lower rates, at **0.8 and 0.6 per 100,000**.
- **Non-Domestic Femicide:** Non-domestic femicides are increasingly recognised. For instance, **5%** of femicides in **France (2019–2022)** and **9% in South Africa (2020–2021)** occurred outside domestic settings.
- **Male as Homicide Victims:** An estimated **80%** of all homicide victims in 2023 were **men while 20% were women**.

- But, **lethal violence** impacts women more than men, with nearly **60% of women intentionally killed in 2023** being victims of intimate partner or family member homicide.

Shares of intimate partner/family member homicides out of all male and female homicides, globally and by region (2023)



- **Preventability of Femicide:** A significant number of women killed by intimate partners had **previously reported violence**, including **22–37% in France (2019–2022)** and similar trends in **South Africa (2020–2021)**.
- **Data and Availability:** Data availability has declined, with only **half as many countries reporting in 2023 as in 2020** (75 countries in 2020).
 - Only a few countries collect data on non-domestic femicides using the **UNODC-UN Women framework**.

What are the Forms of Violence Against Women?

- **Domestic Violence:** It involves actions by a current or former partner, often a **husband, or family members** that cause **physical, sexual, or emotional harm**.
 - Examples include **physical aggression, coercion, psychological abuse**, and controlling behaviours.
- **Sexual Violence:** It involves **unwanted sexual acts** imposed without consent, disproportionately targeting women and girls.
 - Examples include **rape, sexual harassment, online sexual abuse, non-contact sexual abuse**, trafficking, and forced prostitution.
 - In India, over **31,000 rape cases were reported in 2022**, amounting to nearly **87 cases daily**, as per the **National Crime Records Bureau 2022**.
- **Psychological Abuse:** It involves intimidation through **looks, gestures, or shouting**, as well as **humiliation, obscene or derogatory comments**, and public ridicule.

Note:

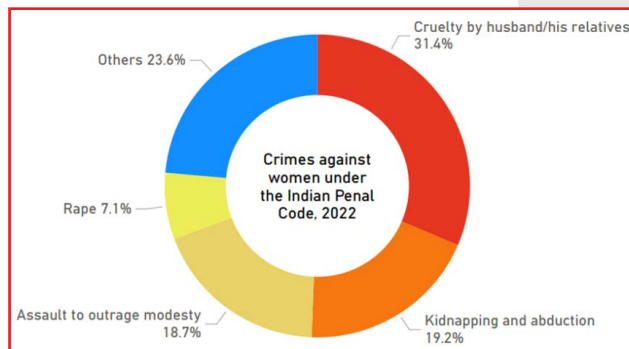


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- It also includes practices like **isolating menstruating women** and **female infanticide**, which violate women's rights and dignity.
- **Cultural Abuse:** It includes harmful social and cultural practices like **female genital mutilation**, **witch-branding**, **child marriage**, **forced marriage**, honour-based violence, and widowhood rituals.
- **Technology-Facilitated Violence:** It involves online **defaming**, **harassment**, **stalking**, **cyberbullying**, distribution of morphed and deepfake videos, and **doxing** (the release of private information about a woman publicly).

What are Key Facts Regarding Gender Violence in India?

- **Increase in Crimes Against Women:** According to the **National Crime Records Bureau (NCRB) 2022 data**, crimes against women **rose 4% in 2022** compared to 2021.
- **Nature of Crimes Against Women:** The majority of crimes against women in 2022 were:



- Additionally, **13,479 cases** were registered under the **Dowry Prohibition Act, 1961**
- **Filing of FIRs:** The NCRB's report reveals that **over 4.45 lakh cases** of crimes against women were registered in 2022, equivalent to **nearly 51 FIRs** (first information report) **every hour**.
- **High Rape Cases:** There were more than **31,000 reported rapes in 2022**. Rapes peaked at nearly **39,000 in 2016**.
 - In **2018**, on average one woman reported a rape **every 15 minutes** across the country.

International Day for the Elimination of Violence Against Women

- **About:** It is observed on **25th November** to raise awareness against **violence against women and girls (VAWG)**.
 - It was designated by the **United Nations General Assembly** in 1999.
- **Honouring the Mirabal Sisters:** The date honours the **Mirabal Sisters (Patria, Minerva, and María Teresa)** of the **Dominican Republic**, symbols of resistance against **Rafael Trujillo's** dictatorship and violence.
 - On **25th November 1960**, the sisters were **assassinated** by Trujillo's orders.

United Nations Office on Drugs and Crime (UNODC)

- **About:** Founded in **1997**, UNODC is a global leader in combating **illicit drugs, international crime, and terrorism**.
- **Headquarters:** It is located in **Vienna** with liaison offices in **New York and Brussels**.
- **Terrorism Prevention:** Expanded its activities in **2002** to assist states in ratifying and implementing universal legal instruments against **terrorism**.

UN Women

- **About:** UN Women is the **UN entity** aiming to address **global gender inequality** and **empower women and girls**.
- **Creation:** Established in **July 2010** by the **United Nations General Assembly** as part of the **UN reform agenda**. It merged four existing UN entities.
 - Division for the Advancement of Women (DAW)
 - International Research and Training Institute for the Advancement of Women (INSTRAW)
 - Office of the Special Adviser on Gender Issues and Advancement of Women (OSAGI)
 - United Nations Development Fund for Women (UNIFEM)
- **Key Goals:** Eliminate discrimination against women and girls.
 - Empower women and achieve equality between women and men.
 - Promote gender equality in development, human rights, peace, and security.

Note:

What are the key Laws for Women's Safety in India?

- The Immoral Traffic (Prevention) Act, 1956
- Indecent Representation of Women Act, 1986
- Protection of Women from Domestic Violence Act, 2005
- Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) (PoSH) Act, 2013
- Protection of Children from Sexual Offences (POCSO) Act, 2012

Domestic Violence Against Women

Domestic violence refers to any form of abuse, whether physical, emotional, sexual, or economic, within the confines of the home, family or domestic unit.

National Family Health Survey-5 (NFHS), 2019-2021

- ⌚ 29.3% of married women experienced domestic/sexual violence
- ⌚ 3.1% of pregnant women suffered physical violence during pregnancy
- ⌚ 87% of married women who are victims of marital violence do not seek help



Legal Frameworks in India

Protection of Women from Domestic Violence Act, 2005 (PWDVA)	<ul style="list-style-type: none"> ■ Covers physical, emotional, sexual, and economic abuse ■ Provides various orders for protection, residence, and relief
Indian Penal Code, 1860	<ul style="list-style-type: none"> ■ Section 498A deals with cruelty by a husband or his relatives ■ Criminalises acts of cruelty, harassment, or torture
Dowry Prohibition Act, 1961	<ul style="list-style-type: none"> ■ Makes giving or receiving dowry a crime
Criminal Law (Amendment) Act, 2013	<ul style="list-style-type: none"> ■ Section 354A amended the IPC to include new offenses related to sexual harassment in cases of domestic violence
National Commission for Women Act, 1990	<ul style="list-style-type: none"> ■ Safeguards women's rights and plays a key role in addressing domestic violence
The Prohibition of Child Marriage Act, 2006	<ul style="list-style-type: none"> ■ Prevent child marriages and prohibit domestic violence against child brides.

Global Initiatives

- ⌚ **Convention on the Elimination of All Forms of Discrimination against Women (CEDAW):** Adopted in 1979 by the UN General Assembly
 - ➔ Eliminating discrimination against women in all areas of life
- ⌚ **UN Declaration on the Elimination of Violence against Women (DEVAW):** First international instrument explicitly addressing violence against women
 - ➔ Provides a framework for national and international action
- ⌚ **Safe Cities and Safe Public Spaces:** Flagship program by UN Women
 - ➔ Preventing and responding to sexual harassment and other forms of violence in public spaces
- ⌚ **Beijing Platform for Action (1995):** Identifies specific actions for governments to take to prevent and respond to violence
- ⌚ **SDG 5 (Gender Equality):** End all forms of discrimination against all women and girls everywhere



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Note:

How to Prevent Femicide as per the Report?

- **Addressing Root Causes:** Focus on the **root causes** of gender-based violence at multiple levels.
 - **Individual Level:** Address **attitudes, behaviours,** and histories of violence.
 - **Interpersonal Relationships:** Improve family dynamics and **partner interactions.**
 - **Community Level:** Strengthen organisational and **community-based support** systems.
 - **Societal Level:** Challenge entrenched **gender norms and stereotypes.**
- **Educational Initiatives:** Integrate curricula to promote gender equality, relationship skills, and **acceptable societal roles for men and women.**
 - Engage both genders in **rethinking attitudes and behaviors** that perpetuate violence.
- **Legal Measures:** Classify femicide as a **distinct criminal offense**, as done in Latin America, by adding **aggravating factors** for homicides driven by gender-based motives.
 - Establish **dedicated units within police, judiciary, and prosecution services** for handling gender-based violence (e.g., Canada, Sweden, Jordan).
- **Risk Reduction:** Train police to identify **high-risk situations** and intervene promptly.
 - Enforce orders **preventing contact** between perpetrators and victims and **limit firearm access** for individuals with histories of intimate partner violence to reduce the odds of killings.
- **Awareness Movements:** Campaigns like **#MeToo** and **Ni Una Menos (Not one [woman] less** in Argentina) to bring public attention to gender-based violence and **condemn harmful practices.**
- **Data Collection and Analysis:** Governments should produce **annual reports** on femicide trends and patterns.
 - Civil Society should establish **“femicide observatories”** to monitor and analyse data from multiple sources.

GQ-RCP Platform for HIV Detection

Why in News?

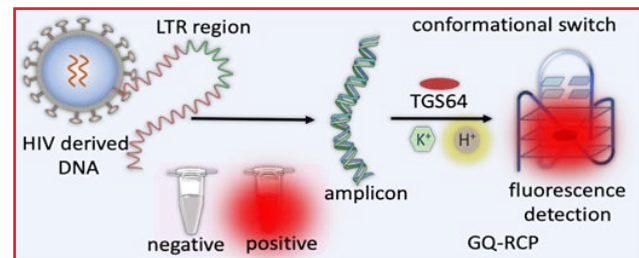
Recently, researchers at the **Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)**, an

autonomous institute under the **Department of Science and Technology**, have developed a **new technology for early and accurate detection of HIV.**

- The newly developed **GQ Topology-Targeted Reliable Conformational Polymorphism (GQ-RCP) platform**, adapted from **SARS-CoV-2** diagnostics, highlights the innovative capabilities of Indian research institutions.

What are the Key Features of GQ-RCP Platform?

- **GQ-RCP Platform:** The **G-Quadruplex (GQ)** structure is a unique **four-stranded DNA conformation** that plays a crucial role in various biological processes, including gene regulation and genome stability.
- **Functionality:** This platform **enables targeted detection of HIV-derived DNA structures** using a **fluorometric test**, enhancing diagnostic reliability and significantly **reducing false positives associated with HIV detection.**
 - The GQ-RCP platform promises to **enhance early detection capabilities** and **reduce reliance on less specific general DNA** sensing probes that contribute to diagnostic inaccuracies.
- **Detection Process:** The detection process involves **reverse transcription and amplification of a genomic segment**, transitioning double-stranded DNA into its GQ conformation through a pH-mediated process.



What is HIV?

- **About:**
 - HIV stands for **Human Immunodeficiency Virus**, which is a virus that attacks the immune system in the human body.
 - It **primarily targets** and damages **CD4 immune cells (a type of White Blood Cell)**, which are essential for the body's ability to fight infections and diseases.
 - Over time, HIV weakens the **immune system**, leaving the body vulnerable to opportunistic infections and **cancers.**

Note:

➤ **Transmission:**

- HIV is primarily spread through the exchange of certain bodily fluids such as blood, semen, vaginal fluids, and breast milk.

➤ **Severity:**

- If left untreated, the virus destroys a person's immune system and they are said to be in the **Acquired Immunodeficiency Syndrome stage (AIDS)** where they get several opportunistic infections that may result in death.

➤ **Cure:**

- Although there are no cures for the infection at present, the disease can be managed using **antiretroviral therapy**.
- These medicines suppress the replication of the virus within the body, allowing the number of CD4 immune cells to bounce back.

What is the State of HIV Infection in India?➤ **Current Prevalence:**

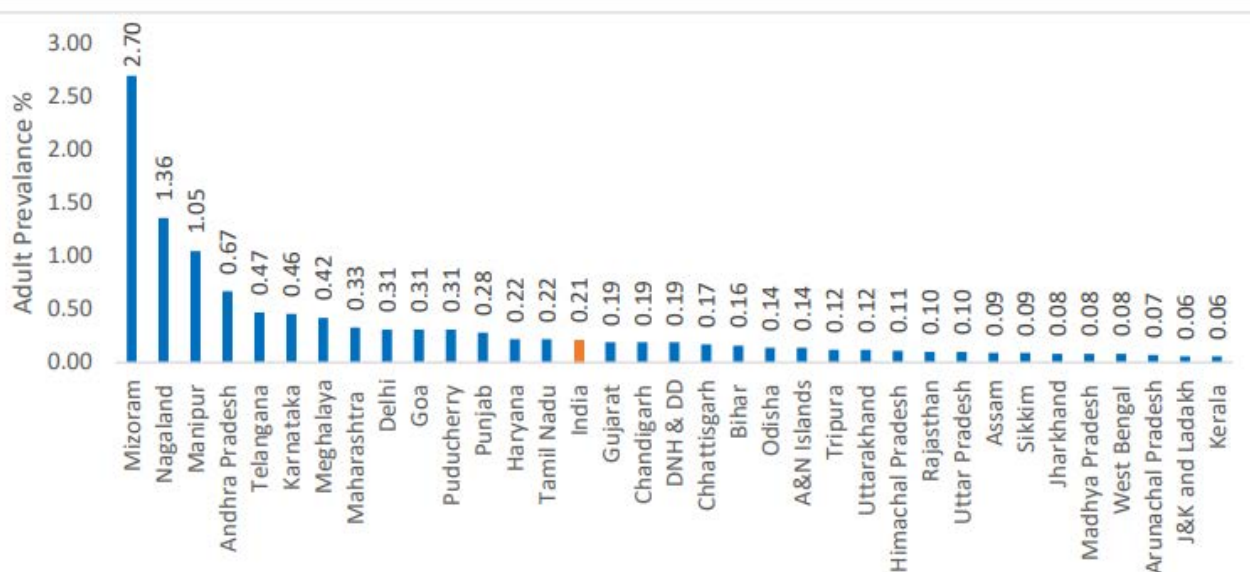
- According to the **National AIDS Control Organization (NACO)**, as of 2021, approximately 2.4 million people are living with HIV in India, with an adult prevalence rate of 0.22%.
- The **India HIV Estimates 2021 report** indicated that there were about 2.3 million people living with HIV, showing a downward trend in new infections

➤ **Demographic Distribution:** The epidemic is concentrated among high-risk populations, including **female sex workers (2.61%)** and **injecting drug users (5.91%)**,

- **Children under 15 years** account for about 3.5% of all infections, while women represent approximately 39% of the total HIV-positive population.

➤ **High-Prevalence States:** The northeast region States have the highest adult HIV prevalence (2.70% in Mizoram, 1.36% in Nagaland and 1.05% in Manipur), followed by southern States (0.67% in Andhra Pradesh, 0.47% in Telangana and 0.46% in Karnataka).

- The number of People Living with HIV (PLHIV) is estimated at around 24 lakhs. Southern States have the largest number of PLHIV viz. Maharashtra, Andhra Pradesh and Karnataka are the top three.

State/UT-wise Adult HIV Prevalence (%), 2021

Note:



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What are the Government Initiatives Related to HIV?

- **National AIDS Control Program (NACP):**
 - **Launch and Evolution:** Established shortly after the first AIDS case was reported in India in 1986, the **NACP** has evolved through multiple phases since its inception in 1992. The program focuses on prevention, treatment, and care for people living with HIV/AIDS.
 - **Phases of NACP:**
 - **Phase I (1992-1999):** Focused on awareness generation, blood safety, and establishing surveillance systems.
 - **Phase II (1999-2006):** Expanded targeted interventions for **high-risk populations and involved NGOs** in implementation.
 - **Phase III (2007-2012):** Dramatically scaled up targeted interventions and strengthened surveillance.
- It emphasised partnerships with civil society organizations to enhance community involvement.
 - **Phase IV (2012-2021):** Aimed to consolidate gains and further **integrate HIV services into the public health system**. Focused on comprehensive care, support, and treatment for people living with HIV.
 - **Phase V (2021-2026):** It aims to reduce new HIV infections and AIDS-related deaths by 80% by 2025-26 compared to 2010 levels.
- **Legislative Framework:** The **HIV/AIDS Prevention and Control Act (2017)** provides a legal framework to protect the rights of people living with HIV/AIDS, ensuring access to treatment without stigma or discrimination.
- **International Support:** India receives technical assistance and funding from various international partners such as **UNAIDS, WHO, the World Bank**, and private foundations like the **Bill & Melinda Gates Foundation**.

The State of the World's Children 2024

Why in News?

Recently, the **United Nations International Children's Emergency Fund (UNICEF)** released the **State of the World's Children 2024 (SOWC 2024)** report that examines the forces and trends shaping children's future by 2050.

- The report highlights **three megatrends** shaping children's lives by 2050 i.e., **demographic shifts, climate crises, and frontier technologies**.

What are the Key Findings of the SOWC 2024 Report?

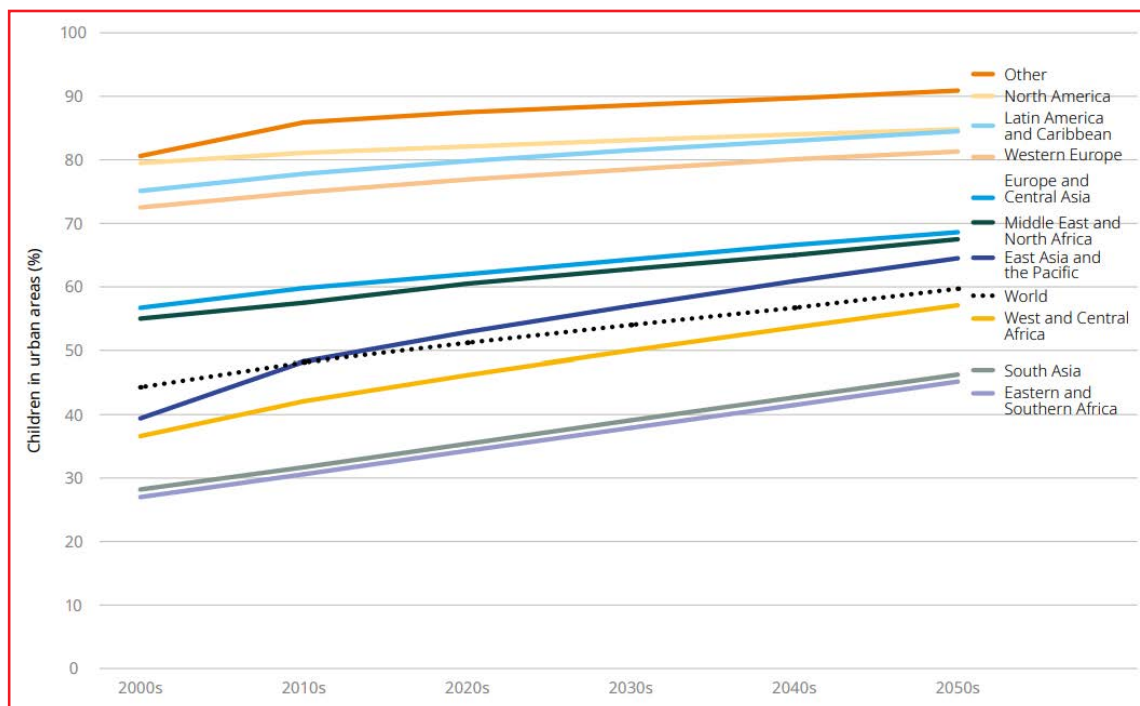
- **Child survival:** Global **newborn survival rates** stand at **over 98%**, while the likelihood of a **child surviving to age 5** stands at **99.5%**.
 - **Life expectancy** increases from **70 years for girls and 66 for boys born in the 2000s**, to **81 years and 76 years**, respectively.
- **Climate Hazards:** Children are projected to be exposed to extreme weather events at significantly higher rates: **8 times more to heatwaves, 3.1 times more to river floods, 1.7 times more to wildfires**, 1.3 times more to droughts, and 1.2 times more to **tropical cyclones**.
- **Socioeconomic conditions:** **23%** of the world's children are projected to live in the **28 countries** currently classified as **low-income**, more than double the share in these countries in the 2000s (11%).
- **Education:**
 - The global **education gap** between girls and boys is expected to **narrow**, with more girls completing upper secondary education in some regions.
- **Gender Equality:** By the **2050s**, **gender inequality** is expected to **reduce** in children's lives globally.
 - However, many children are projected to live with high gender inequality in **Eastern and Southern Africa and West and Central Africa**.
- **Conflict Exposure:** The number of children living in **conflict-prone areas** is projected to drop from more than **833 million in the 2000s to 622 million in the 2050s**.

Note:



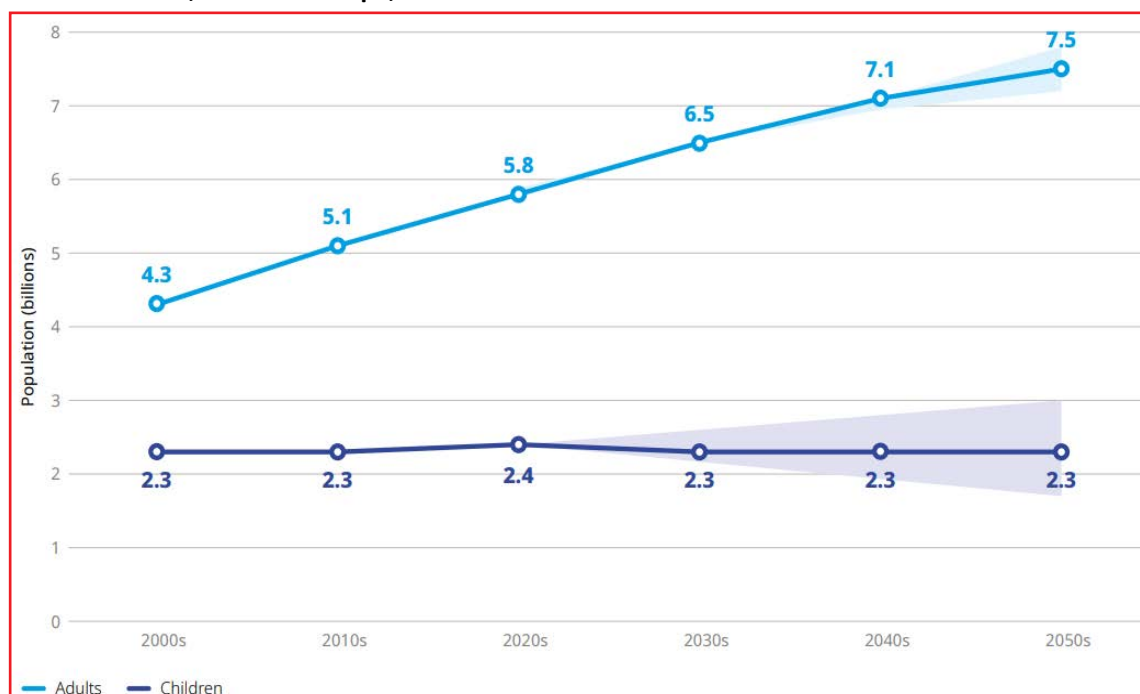
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- **Urbanisation:** Nearly **60%** of children globally are projected to live in **urban areas** in the **2050s**, up from 44% in the 2000s.



What are the Megatrends that are Shaping Children's Lives?

- **Demographic Shift:** By 2050, the global child population is expected to stabilise at **2.3 billion**. Child populations will **grow** in **South Asia, Eastern and Southern Africa, and West and Central Africa**.
- Africa's child population share is expected to **fall below 40%** (from 50% in the 2000s), while it will drop below **19% in East Asia, Western Europe, and North America**.



Note:

- **Climate Crisis:** Nearly **1 billion children** live in countries with high exposure to climate hazards, such as **pollution**, **extreme weather**, and **biodiversity loss**.
 - Children's developing bodies are particularly vulnerable to pollution and extreme weather, with their **brains, lungs, and immune systems** at risk even before birth.
 - Since 2022, **400 million students** around the world have experienced school closures due to extreme weather.
- **Frontier Technologies:** **Artificial intelligence (AI)**, **neurotechnology**, next-generation **renewable energy** and **mRNA vaccine** breakthroughs could significantly improve childhood in the future.
 - However, While over **95%** of people in high-income countries are **internet-connected**, only **26%** in **low-income countries** have access.

What are India-Specific Findings of the SOWC 2024 Report?

- **Child Population:** By 2050, **India** is expected to have the **largest child population**, with about **350 million children**, making up **15%** of the global total.
 - **India, China, Nigeria and Pakistan** together are expected to account for **more than a third** of the world's population of children by **2050**.
- **Climate Risks:** India ranks **26th** out of **163 countries** on the **Children's Climate Risk Index (CCRI) 2021**, reflecting high exposure to climate-related hazards.
 - Indian children face significant risks from **extreme heat, floods, droughts, and air pollution**.
 - **CCRI** is released by **UNICEF** that ranks countries based on children's exposure to climate shocks like **cyclones and heatwaves**, and their vulnerability due to access to essential services.

Note: **UNICEF** has been collaborating with the government of India for the **past 75 years**, and in **1992**, India ratified **The Convention on the Rights of the Child, 1989**.

- The United Nations Convention on the Rights of the Child was adopted in **1989** to protect and fulfil children's rights.

UNICEF

- **About:** UNICEF is a leading **global organisation** that works to ensure that every child **survives, thrives, and fulfils** their potential, regardless of their background or where they live.
 - UNICEF's work is **impartial, non-political, and neutral** and it operates in over **190 countries and territories**.
- **Establishment:** It was established in **1946** in the aftermath of **World War II** to help children whose lives and futures were at risk – no matter what role their country had played in the war.
 - UNICEF became a **permanent part** of the **United Nations** in **1953**.
- **Core Activities:** Education, health, and nutrition, Child protection, Clean water and sanitation and Climate change and disease.
 - UNICEF is guided by the **Convention on the Rights of the Child, 1989**.
- **Recognition:** It was awarded the **Nobel Prize for Peace** in **1965** for "promotion of brotherhood among the nations".
- **Strategic Plan (2022–2025):** It drives coordinated efforts for an inclusive **Covid-19** recovery, faster progress toward the **SDGs**, and a society where every child is included, empowered, and has their rights fulfilled.

How to Secure Children's Future as per the SOWC 2024 Report?

- **Prepare for Demographic Transitions:** Ensure access to **maternal, newborn, child and adolescent healthcare**, along with sexual and **reproductive health** and **family planning** services.
 - Create **child-friendly cities** with safe spaces, infrastructure, and support for marginalised children, including those with disabilities.
- **Invest in Climate, Mitigation and Education:** Ensure children's needs are addressed in **National Adaptation Plans, Nationally Determined Contributions** and other climate strategies.
 - Integrate climate resilience into **local planning**, including schools, healthcare, social services, and water and sanitation.

Note:



- **Connectivity and Safe Design:** Promote **digital literacy** and skills among children and educators to complement traditional teaching.
 - Implement **rights-based governance** for new technologies, with oversight mechanisms to anticipate risks.

Tribal Development Approaches

Why in News?

Recently, **Hana-Rawhiti Kareariki Maipi-Clarke**, the youngest sitting Member of Parliament in New Zealand, who is representing a **Maori tribe** in the country, staged a **haka protest** against the **Treaty Principles Bill**, which seeks to reinterpret the **1840 Treaty of Waitangi**.

- The protest highlighted the debate on the **approaches to tribal development policy** in balancing cultural heritage with modern governance.

What is Haka?

- **About:** The haka is a traditional Maori dance, performed by warriors on the battlefield or to welcome others, involving chanting, facial expressions, and hand movements. It represents Maori identity and has become a symbol of resistance.
 - The Maori Tribe is an **indigenous tribe who have inhabited New Zealand**.
- **Haka Protest:** The haka protest is a response to the introduction of the **Treaty Principles Bill**.
 - The Bill seeks to reinterpret the **1840 Treaty of Waitangi**, a foundational document that **established the relationship between the British Crown and Maori chiefs**.
- **Treaty Principles Bill:** It aims to ensure equality for all New Zealanders. Critics argue that by applying the Treaty principles equally to all New Zealanders, **the bill fails to recognize the distinct rights of the Māori as Indigenous people**.
 - This approach is seen as undermining the **legal protections afforded to Maori under the Treaty of Waitangi**.

What are the Approaches to Tribal Development Policy?

- **Isolation:** This approach emphasises protecting Indigenous communities by **limiting their interaction with modern society** to preserve their cultural and ecological systems.
 - **Examples:** The **Sentinelese tribe** in the Andaman Islands lives in total isolation, protected by strict laws under the **Andaman and Nicobar Islands (Protection of Aboriginal Tribes) Act, 1956**.
 - **Benefits:** Traditional lifestyles, languages, and knowledge systems are preserved.
 - Shields communities from **external influences** that may exploit **resources or labour**.
 - Indigenous lands are often rich in biodiversity, preserved through their sustainable practices.
 - **Challenges:** Isolation often results in **lack of healthcare, education, and economic opportunities**.
 - Communities may remain **excluded from national development processes**.
 - Changes like **climate impacts** or encroachment can render isolation unsustainable.
- **Assimilation:** This approach incorporates Indigenous communities into mainstream society, aiming for a **unified national identity**, but it can undermine their unique cultural practices.
 - **Examples:** In the **United States, Native American children** were placed in boarding schools to **"Americanize" them**, suppressing their languages and traditions.
 - In Australia aboriginal children from the **"Stolen Generations (aboriginal and/or Torres Strait Islander people)"** were forcibly removed from their families to assimilate into White culture.
 - **Benefits:** Access to basic amenities like education, healthcare, and job opportunities can improve quality of life. Assimilation can **bridge gaps in economic and political representation**.
 - **Challenges:** Forced assimilation **erodes Indigenous identity** by causing the **loss of language, traditions, and spiritual practices**, weakening cultural heritage.
 - The forced assimilation often meets **resistance, fostering alienation and distrust between**

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Indigenous peoples and the government, complicating efforts to balance cultural preservation with modern governance.

- **Integration:** It involves incorporating Indigenous peoples into modern governance while **respecting their cultural identity, ensuring their rights, traditions, and autonomy** are preserved within broader society.
 - **Examples:** The **Gundjeihmi and Bininj tribes** work alongside the Australian government in managing **Kakadu National Park**, combining **traditional knowledge** with modern conservation practices.
 - **Benefits:** Inclusion in governance gives **Indigenous peoples a voice in decision-making processes** that affect their communities.
 - Recognition of Indigenous rights through modern governance can enhance their ability to **protect lands, traditions, and resources**.
 - Collaborative frameworks can foster **trust between Indigenous communities and governments**.
 - **Challenges:** Indigenous communities may face **systemic racism** and **inequality despite formal inclusion**.
 - Governments and industries may resist ceding power or resources to Indigenous authorities.

What is India's Approach to Tribal Development Policy?

- **Pre-Independence Approach:** The British enforced an **isolationist approach** for tribal areas by classifying them as **"Excluded" or "Partially Excluded" zones** to ensure law and order.
 - In 1874, the **Scheduled District Act (Act XIV)** was introduced in British India, which exempted certain areas from regular laws to protect them from exploitation.
- **Post Independence:** Government policies have been oriented towards both autonomy and integration.
 - Policies focused on autonomy include the **Panchayats (Extension to the Scheduled Areas) Act, 1996 (PESA)**, the **Forest Rights Act, 2006** and **constitutional safeguards such as the Fifth and Sixth Schedules**.

- These measures prioritise preserving tribal self-governance, ensuring minimal interference in their cultural and religious practices, and affirming their **rights over land and forest resources**.
- The **Integration-Oriented Policy** aimed to incorporate tribals into the national framework while preserving their identity and autonomy. It is **guided by Jawaharlal Nehru's Tribal Panchsheel policy**, which emphasises self-development, respect for tribal rights, minimal external imposition, local participation in administration, and human-centred outcomes over financial metrics
- Recent initiatives for integrating tribal communities in India include the **Pradhan Mantri Particularly Vulnerable Tribal Group (PVTG) Development Mission, Eklavya Model Residential Schools, Pradhan Mantri Van Dhan Yojana**, and a mission to eliminate **sickle cell anaemia**.

Global Alliance Against Hunger and Poverty

Why in News?

Recently, a new **Global Alliance Against Hunger and Poverty** was launched at the **G20 Leaders Summit in Brazil** to eradicate **poverty and hunger** globally.

- The alliance is an important step towards the implementation of the **Deccan High-Level Principles on Food Security and Nutrition 2023**, adopted at the **G20 New Delhi Summit 2023**.
- In addition, **India's Prime Minister** addressed a session on **'Social Inclusion and the Fight against Hunger and Poverty,'** sharing India's experiences and success stories.

What are the Key Facts About the Global Alliance Against Hunger and Poverty?

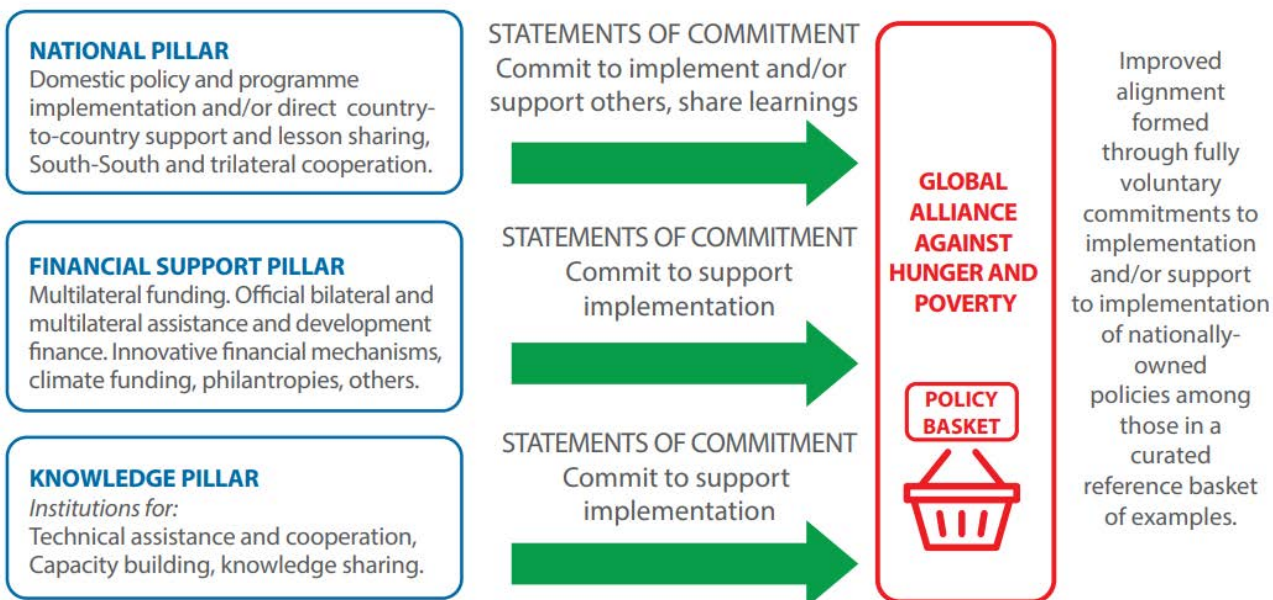
- **About:** It is a voluntary coalition of **governments, international organisations, NGOs, and other stakeholders** working to eradicate **hunger (SDG 2), poverty (SDG 1), reduce inequalities (SDG 10)**, and support other interlinked SDGs.
 - It has three pillars – knowledge, finance and knowledge— at the country level.

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ALLIANCE OPERATION AT GLOBAL LEVEL— FORMING A WEB OF VOLUNTARY COMMITMENTS FOR PARTNERSHIPS



➤ Objectives:

- **Political Commitment:** The G20 and alliance members should lead **sustained political efforts** to mobilise collective action against hunger and poverty globally.
- **Mobilising Resources:** Bring together **domestic and international support**, including public and private funds, for country-led programs in nations facing hunger and poverty.
- **Guiding Framework:** It will follow a **structured governance framework** to coordinate efforts, using a reference basket approach to guide **country-led actions** without requiring the collective endorsement of specific policies.
- **Programs and Policies:** Its programs and policies include **diverse strategies** such as:
 - **Food assistance** and social protection schemes (e.g., cash and in-kind transfers).
 - **School feeding programs**, maternal and child nutrition, and support for early childhood.
 - Promotion of **local food markets**, smallholder farmers, and **sustainable farming practices**.
 - Health and care services for **vulnerable groups** (e.g., children, women, older persons, refugees, migrants, persons with disabilities).
- Access to **finance, extension services, and agricultural inputs** for smallholder farmers.
- **Collaboration:** The Alliance is open to all willing **United Nations** member and observer states, development partners, and knowledge institutions.
 - Key contributors include **FAO, UNICEF, WFP, the World Bank**, and other international organisations.
- **Country-level Action:** Governments are encouraged to implement policies that enhance **social protection, food security, and nutrition**, aligned with SDGs, and contribute to the broader **global sustainability agenda**.
- **Vulnerable Populations:** The Alliance emphasises addressing the needs of vulnerable groups, including **women, children, indigenous peoples, local communities, refugees, migrants, and persons with disabilities**.
 - Special attention is given to increasing adaptation financing for the **Agriculture, Forestry, and Land Use (AFOLU) sector**, vital for the livelihoods of poor households and smallholder farmers.
- **Indigenous Knowledge:** Indigenous production practices, including growing traditional crops like **millets, quinoa, and sorghum**, are essential to developing healthier and more resilient food systems.

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What is the Financing Mechanism of the Global Alliance against Hunger and Poverty?

- **Mobilising Resources:** Innovative financing approaches like **blended financing, concessional co-financing, and partnerships** are encouraged to support a country's implementation of policies.
 - **Blended financing** combines concessional funds (**low-interest or grants**) with non-concessional funds (**market-based financing**).
 - **Concessional co-finance** is **below-market-rate finance** provided by major financial institutions.
- **Official Development Assistance (ODA):** Developed countries are urged to fully honour their **ODA commitments** to address the needs of countries facing high levels of **poverty, hunger, and malnutrition**.
- **Multilateral Development Banks (MDBs):** It supports boosting the financial capacity of **MDBs**, including the **International Development Association (IDA)**, the largest source of international finance for addressing poverty, hunger, and malnutrition.
 - Mobilisation of new resources and encouraging donor pledges to institutions such as the **Global Agriculture and Food Security Program (GAFFP)** are encouraged.
- **Special Drawing Rights (SDRs):** It encourages the **voluntary rechanneling** of **Special Drawing Rights (SDRs)** to support countries in need while respecting legal frameworks and the reserve asset status of SDRs.

What is the Need for the Global Alliance Against Hunger and Poverty?

- **Escalating Poverty and Hunger:** In **2022**, approximately **712 million people lived in extreme poverty**—23 million more than in 2019—with the highest rates in the poorest countries.
 - In **2023, 733 million people faced hunger**, and **148 million children** under five suffered from **stunting** (low height-for-age).
- **Increasing Financing Gaps:** The widening gaps in financing for achieving **Sustainable Development Goals (SDGs)**, particularly **SDGs 1 (no poverty) and 2 (zero hunger)**, highlight the urgent need for additional resource mobilisation.
 - A global alliance can bridge the resource gap with **innovative financing**, international cooperation, and equitable resource allocation.

- **Gender-Based Food Insecurity:** **26.7% of women** worldwide were **food insecure**, compared to **25.4% of men**, showing a gender gap worldwide.
- **Insufficient Responses:** Ineffective policies, inadequate **social protection, and limited resources** continue to worsen hunger and malnutrition, leaving vulnerable populations without sufficient means to access adequate food and healthy diets.
- **Economic Impact of Poverty:** Poverty, hunger, and malnutrition impose major economic costs on **households, health systems, and national economies**, particularly in developing countries.
 - This cycle **lowers productivity, hampers sustainable growth**, and deepens social and economic inequalities.
- **Crisis Among Vulnerable:** Rising acute **food insecurity**, humanitarian crises, and fragile states call for improved crisis prevention, preparedness, and resilience.
 - A global alliance can enable targeted investments and coordinated responses to protect vulnerable populations.

What are Deccan High-Level Principles on Food Security and Nutrition 2023?

- **About:** It recognises the **global food security crisis** and the impact of climate change, geopolitical tensions, conflicts, and systemic shocks.
 - It emphasises the need for concerted actions to achieve **Zero Hunger (SDG2)** by 2030.
- **G20's Role:** G20 members, as major **agricultural producers, consumers, and exporters**, have a collective responsibility to reinforce global efforts to enhance **food security and nutrition**.
- **Principles:** It consists of **7 principles**:
 - **Humanitarian Assistance:** Increased multisectoral **humanitarian aid** and improved coordination in providing **food assistance** during crises and conflicts.
 - **Availability and Access to Nutritious Food:** Promote **food and cash-based safety net programs**, sharing best practices for effective implementation.
 - **Climate-Resilient Agriculture:** Collaborate on **scalable technologies** and innovations to tackle climate change and biodiversity loss.

Note:

- **Resilience and Inclusivity in Value Chains:** Enhance the resilience of **agriculture value chains** by strengthening infrastructure, reducing **food waste**, and implementing risk management policies.

- It focuses on inclusivity by supporting **women, youth, small landholders, small and medium enterprises' (SMEs), and under-represented groups.**

- **One Health Approach:** Implement the **"One Health" approach** to combat **antimicrobial resistance (AMR)** and manage the risks of **zoonotic diseases.**

- **Innovation and Digital Technology:** Facilitate affordable access to **digital infrastructure** and empower farming communities.

- **Responsible Investments:** Promote **public-private partnerships**, stimulate private sector investment, and facilitate access to finance, especially for youth participation in agriculture.

What are India's Progress on Hunger and Poverty Alleviation?

- **Poverty Alleviation:** Between **2014-2024**, India lifted **250 million** people out of poverty.
- **Food Security:** Over 800 million people are being given **food grains free of cost.**
- **Health Insurance:** 550 million people are benefiting from the **Ayushman Bharat-Pradhan Mantri Jan Arogya Yojna (PM-JAY).**

- **60 million senior citizens**, over the age of 70, will also be able to benefit from **free health insurance.**

- **Financial and Social Inclusion:** Over **300 million women micro-entrepreneurs** have been linked to banks and given access to credit.

- **Farmer Support:** Under **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, over **40 million farmers** have received benefits worth **20 billion US dollars.**

- Under **PM-KISAN**, assistance worth **over 40 billion dollars** has been given to **110 million farmers.**

- India has developed over **2000 climate-resilient crop varieties.**

- **Nutritional Focus:** The **Saksham Anganwadi and Poshan 2.0 campaign** focuses on nutrition for pregnant women, newborn babies, children under the age of 6, and adolescent girls.

- Through the **Mid Day Meal scheme**, special attention is being paid to the nutritional needs of school-going children.

- **Global Contributions to Food Security:** Recently, India has provided humanitarian assistance to **Malawi, Zambia and Zimbabwe.**

Note: India highlighted **'back to basics' and 'march to the future'** approach for India's success in poverty and hunger alleviation.

- The approach emphasises on the most essential aspects like **access to credit, insurance etc** for looking forward, **embracing innovation, and driving progress.**



Note:

Science & Technology

Highlights

- *Moiré Materials and Superconductivity*
- *MACE Telescope in Ladakh*
- *Centenary of Bose-Einstein Statistics*
- *One Day One Genome Initiative*
- *Allotropes of Carbon*
- *Sickle Cell Eradication*
- *Indian Equatorial Electrojet Model*
- *Regulatory Framework for Laboratory-Grown Meat*
- *Jeddah Commitments on AMR*
- *Volcanism on the Far Side of the Moon*
- *Black Hole Triple System*

Moiré Materials and Superconductivity

Why in News?

A recent **Nature** study found that **moiré materials** made from **semiconductors** can also be **superconducting**, a property **previously** thought to be exclusive to **graphene**.

What are the Key Facts About Moiré Materials?

- **About:** Moiré materials are materials having **unique properties** due to the **interference pattern** formed when **two repetitive structures are overlaid at a slight angle**.
- **Creation of Moiré Materials:** Moiré materials are created by **stacking two layers** of a **two-dimensional (2-D)** material, such as **tungsten diselenide**, and **twisting one layer** at a small angle (3.65°).
 - The **twist** between the layers creates a **unique moire pattern** that gives rise to **new electronic behaviors** not present in individual layers.
- **Electronic Properties:** The twist in layers creates **flat bands** in the electronic structure, where **electrons** move **slowly** with nearly **constant energy**.
 - This slow movement boosts **electron-electron interactions**, crucial for superconductivity.
- **Research on Tungsten Diselenide (tWSe₂):** tWSe₂, a semiconductor moiré material, demonstrated **superconductivity** at a transition temperature of

approximately **-272.93° C**, comparable to that of **high-temperature superconductors**.

- The superconducting state in tWSe₂ was found to be **more stable** than in other moiré materials.

- **Comparison with Graphene Superconductors:** **Graphene**-based moiré materials achieve superconductivity through **electron-lattice interactions** and **flat band formation**, while **tWSe₂** relies on **electron-electron interactions**, making it more stable and potentially more robust.

- Electron-lattice interactions are the interactions between **electrons and the atomic lattice** (the arrangement of atoms) in a material's crystal structure.

- **Significance of Findings:** **Stable superconductivity** at low temperatures enables practical applications in **quantum computing** and **electronics**.

- It can aid in **designing new materials** for future technologies.

Note: Superconductivity is the property of certain materials to conduct **direct current (DC) electricity without energy loss** when they are **cooled below a critical temperature (T_c)**.

- These materials also **expel magnetic fields** as they transition to the superconducting state.
- Superconductivity was discovered in **1911 by Heike Kamerlingh-Onnes**. For this discovery, he won the **1913 Nobel Prize in Physics**.
- E.g., **MRI machines** use an alloy of **niobium and titanium**.

Note:

MACE Telescope in Ladakh

Why in News?

Recently, the **Major Atmospheric Cherenkov Experiment (MACE) telescope** was inaugurated in **Hanle, Ladakh**, representing a significant advancement in **gamma-ray astronomy**.

- It enables scientists to **explore gamma rays** with energies **exceeding 20 billion electron volts (eV)**, emitted from sources **beyond the Milky Way**, including **pulsars, blazars**, and **gamma-ray bursts**.

What are the Key Features of MACE?

➤ About MACE:

- Positioned at an **altitude of approximately 4.3 kilometers**, MACE is the highest imaging Cherenkov telescope globally, making it the **largest of its kind in Asia and the second-largest worldwide**.
- The **MACE** uses an **Imaging Atmospheric Cherenkov Telescope (IACT)** to detect high energy gamma rays indirectly.
 - When high-energy gamma rays enter Earth's atmosphere, they create **electron-positron pairs**, producing Cherenkov radiation.
 - MACE captures this **faint blue light (Cherenkov radiation)** with its sophisticated equipment.
 - Its light collector, composed of **356 mirror panels in a honeycomb structure**, enhances stability and reflective area.

➤ Research Objectives:

- The **primary goal is to study high-energy gamma rays from cosmic sources**.
- MACE seeks to understand **dark matter** by detecting gamma rays from **weakly interacting massive particles (WIMP)** annihilation events and investigating WIMPs, which may constitute much of the universe's mass.

➤ Institution Involved:

- **Bhabha Atomic Research Centre (BARC)**
- **Indian Institute of Astrophysics**

➤ Technological Innovations:

- The telescope features a **high-resolution camera with 1,088 photomultiplier tubes** that detect and amplify faint signals from Cherenkov radiation.
- Its altitude provides a clear view above atmospheric disturbances, enhancing its observational capabilities.

Telescopes

- A telescope is an optical instrument designed to observe distant objects by collecting and magnifying light or other forms of electromagnetic radiation.
- There are various types of telescopes, including **optical telescopes (which observe visible light)**, **radio telescopes (which detect radio waves)**, and **gamma-ray telescopes (which capture high-energy gamma rays)**.

Gamma Rays and Related Health Hazards

- **Gamma rays**, high-energy **electromagnetic radiation**, can penetrate most materials, including human tissue, posing health risks.
 - Gamma rays have **the shortest wavelength and the highest energy**, with each light-particle possessing more than 100,000 electron volts.
 - **Gamma rays are produced by exotic energetic objects** in the cosmos, including rapidly spinning pulsars, supernova explosions, hot whirlpools of matter around black holes, and gamma-ray bursts.
 - They are also emitted during **radioactive decay** or **nuclear reactions**.
- Exposure to gamma rays can **damage cells and DNA**, leading to radiation sickness, increased **cancer** risk, and other long-term effects.

What are other Similar Telescope Projects?

➤ Indian Astronomical Observatory (IAO):

- The **IAO**, located in Hanle, is one of the highest astronomical observatories in the world. It is operated by the **Indian Institute of Astrophysics (IIA)** and features several telescopes, including the **Himalayan Chandra Telescope (HCT)**.

Note:

- **Dark Sky Reserve:**
 - A **Dark Sky Reserve** is a designation given to a place that has policies in place to ensure that a tract of land or region has minimal artificial light interference.
- **High Altitude Gamma Ray (HAGAR):**
 - **HAGAR**, located at 4270 m in Hanle, Ladakh, is the **first high-altitude gamma-ray telescope array** designed by utilizing the atmospheric **Cherenkov technique**. It was designed for a **low energy threshold** with a minimal mirror area.
- **Giant Metrewave Radio Telescope:**
 - **GMRT** is an array of thirty fully steerable parabolic radio telescopes of 45 metre diameter. It is operated by the National Centre for Radio Astrophysics of the Tata Institute of Fundamental Research.

Centenary of Bose-Einstein Statistics

Why in News?

Recently, the centenary of '**Bose-Einstein**' statistics was celebrated, honouring **Satyendra Nath Bose's** groundbreaking work on **particle indistinguishability**.

- His contributions laid the foundation for key advancements in **quantum mechanics**, including the **Bose-Einstein Condensate**, and continue to shape modern physics.

Who was Satyendra Nath Bose?

- **Early Life:** Born on 1st January 1894, in Calcutta (now Kolkata), Bose was a promising student, excelling in mathematics from an early age.
 - He was inspired by **Jagadish Chandra Bose**, a pioneer in radio wave research, SN Bose ventured into the realm of quantum mechanics, which led to his groundbreaking contributions to the field.
- **Bose's Contribution:**
 - **Bose-Einstein Statistics:** In 1924, Bose published a paper, "**Planck's Law and the Hypothesis of Light Quanta**," where he introduced a new way

of counting particles, **particularly photons**, as **indistinguishable entities**.

- Albert Einstein recognized the significance of Bose's paper and expanded on his ideas, leading to the development of **Bose-Einstein statistics** and the **discovery of Bose-Einstein condensates**.
- Bose-Einstein statistics challenged the **classical mechanics' assumption** that **particles are distinguishable**, where each particle is considered unique and can be tracked individually.
- Bose-Einstein Statistics distinguishes between two classes of particles in quantum mechanics: **bosons and fermions**.
 - Bosons, named after Bose, can occupy the **same quantum state**, making them indistinguishable. This means **one boson cannot be distinguished from another**.
 - ◆ This property enables phenomena like **superconductivity** and **superfluidity**.
 - Fermions, in contrast, obey the **Pauli exclusion principle** (no two electrons can have the same four electronic quantum numbers), which governs the **structure of matter**.
- **Bose-Einstein Condensate (BEC):** Bose's work, expanded by Einstein, led to the prediction of BEC, a unique state of matter, formed when bosonic atoms are cooled to **near absolute zero (- 273.15° C)**, causing them to merge into a single quantum entity with wave-like properties.
 - The concept remained theoretical until it was experimentally confirmed in **1995 by Eric Cornell and Carl Wieman**, who received the **Nobel Prize** for their work in 2001.
- **Relevance in Modern Physics:** Discoveries such as the **Higgs boson** and advancements in **quantum computing** highlight the enduring relevance of Bose's principles. Bose-Einstein statistics impact not only physics but also **cosmology** and **condensed matter science**.
- **Awards and Honours:** Satyendra Nath Bose, widely known as the **Father of the God Particle**, received the **Padma Vibhushan** in 1954. In 1959, he was named **India's National Professor**, the highest honour for a scholar, a position he held for 15 years.

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NATIONAL QUANTUM MISSION

Aims to put India among the top six leading nations involved in the R&D in quantum technologies

■ Presently, R&D works in quantum technologies are underway in the US, Canada, France, Finland, China and Austria ■

■ **Duration:** 2023-24 to 2030-31

■ **Nodal Ministry:** Ministry of Science & Technology

■ **Highlights of the Mission:**

- Four Thematic Hubs (T-Hubs) in different domains across the country
- Wide-scale applications ranging from healthcare and diagnostics, defence, energy and data security

■ Strengthening of indigenously building quantum-based computer

■ Help develop magnetometers with high sensitivity in atomic systems and atomic clocks

■ Support design and synthesis of quantum materials

A huge boost to National priorities like digital India, Make in India, Skill India, Stand-up India, Start-up India, Self-reliant India and SDGs

Quantum Technology

■ Works by using the principles of quantum mechanics (the physics of sub-atomic particles), including quantum entanglement and quantum superposition ■

Quantum Superposition

The ability of a quantum system to be in multiple states simultaneously

While digital computers store data as bits (the ones and zeros of binary), quantum computers use qubits that exist as one, zero or both at the same time

This superposition state creates a practically infinite range of possibilities, allowing for fast simultaneous and parallel calculations

Quantum Entanglement

■ It means the two members of a pair (Qubits) exist in a single quantum state

■ If you change the properties of one of them, the other changes instantly

■ This can be used to create a secure encryption key in quantum cryptography

■ If an eavesdropper tries to intercept the transmission, the entangled state of the particles will be disturbed, making the attempt detectable



One Day One Genome Initiative

Why in News?

Recently, the 'One Day One Genome' initiative was launched by the Department of Biotechnology (DBT) and **Biotechnology Research and Innovation Council (BRIC)**.

- It was launched on the 1st foundation day of BRIC at the National Institute of Immunology (NII), New Delhi.

What is One Day One Genome Initiative?

- **About:** It is an initiative designed to highlight India's unique **microbial diversity** and its role in

the environment, agriculture, and human health, leveraging data from **genome sequencing**.

- **Objective:** It aims to publicly release a fully annotated **bacterial genome** from India, along with a detailed summary, infographics, and genome data.
- **Coordination:** It will be coordinated by **Biotechnology Research and Innovation Council-National Institute of Biomedical Genomics (BRIC-NIBMG)**, an institute of the Department of Biotechnology.
- **Potential Benefits:**
 - Understanding microbial functions can lead to **better waste management** and pollution control strategies.

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- Insights into beneficial microbes can enhance **crop yields and promote sustainable farming practices**.
- Identifying microbes with antimicrobial properties may lead to **new treatments and drugs**.

Genome Sequencing

- **About:** The genome of an organism consists of a unique sequence of **DNA or RNA** made up of **nucleotide bases**. Determining the order of these bases is called **genomic sequencing**.
- **Genome sequencing** helps identify genome-encoded traits such as important **enzymes, antimicrobial resistance, and bioactive compounds**.
- **Genome Sequencing Process:**
 - **Extraction:** DNA or RNA is extracted from cells of **bacteria, viruses, or pathogens**.
 - **Library Preparation:** RNA or single-stranded DNA is converted into double-stranded DNA, chopped into shorter pieces, and ends of the fragments are modified.
 - The sample, now called a **"library,"** is ready for sequencing.
 - **Sequencing:** The library is loaded into a sequencer that identifies **nucleotide bases** using **fluorescence** or electrical current changes.
- **Applications:** It is critical for understanding microbial dynamics, improving **public health, managing environments, advancing agriculture**, and developing medical solutions.

How do Microorganisms Contribute to Environment, Agriculture and Human Health?

- **Role in Environment:** They play crucial roles in **biogeochemical cycles, soil formation, mineral purification**, and the breakdown of **organic wastes and toxic pollutants**.
 - E.g., Anaerobic bacteria like **Clostridium** and **Methanogens** break down organic matter into **methane** and carbon dioxide.
- **Role in Agriculture:** Microorganisms are vital for **nutrient cycling, nitrogen fixation, soil fertility**, pest and weed control, and responding to environmental stress.

- E.g., **Rhizobium bacteria** make a **symbiotic relationship** with **leguminous plants** (e.g., beans, peas, lentils) to convert atmospheric **nitrogen** into **ammonia** that the plant can use.

- **Role in Human Health:** They play essential roles in **digestion, immunity, and even mental health**.

- E.g., **Lactobacillus** bacteria break down **lactose** (milk sugar) and other **carbohydrates** into **lactic acid**.

Allotropes of Carbon

Why in News?

Carbon and its allotropes remain in news due to its varied **physical and chemical properties**.

- Allotrope refers to one or more forms of a **chemical element** that occur in the **same physical state**.
- **Carbon has four main allotropes** namely Diamond, Graphite, Fullerenes, and Graphene.
 - Additionally, **carbon nanotubes** and **amorphous carbon** (like charcoal) are also considered forms of carbon, but they are less commonly classified as primary allotropes.

What are the Allotropes of Carbon?

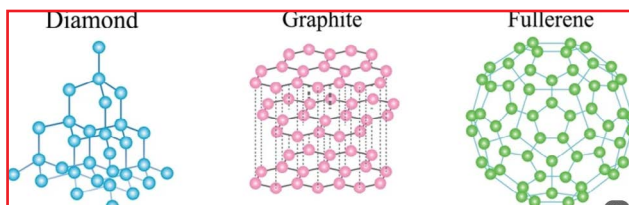
- **Graphite:** In graphite, each carbon atom forms bonds with **three other carbon atoms**, creating **two-dimensional sheets**. It is made up of layers of Carbon atoms arranged in **hexagonal arrays**.
 - **Electricity Conduction:** Graphite is a **good conductor of electricity** due to the existence of **delocalised electrons** within its layers.
 - **Lubricant:** Its layers can **easily slide** over each other, making it suitable as a **solid lubricant**.
 - **Hardness:** Graphite is the **softest** carbon allotrope.
 - **Graphene:** Graphene is a single, **one atom thick** layer of graphite. It has vast potential in **electronics, energy storage, sensors, coatings, composites**, and biomedical devices.
 - Its **high surface area** and biocompatibility make it ideal for **drug delivery and tissue engineering**.
- **Diamond:** It is made up of a **three-dimensional** network of Carbon atoms arranged in a **tetrahedral structure**, where each carbon atom is bonded to other **four carbon atoms**.

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- **Hardness:** It is recognized as the **hardest naturally** occurring material due to its strong covalent bonds, making it suitable for **industrial cutting, drilling, and grinding applications**.
- **Transparency:** Some diamonds exhibit **high transparency** in the visible spectrum, making them valuable in **jewellery**.
- **Thermal Conductivity:** Diamonds possess excellent **thermal conductivity**, making them useful in heat sinks.
- **Electricity Conduction:** It **lacks electrical conductivity** in its pure form as it has **no free electrons or "charge carriers"** available to conduct electricity.
- **Lab-grown Diamonds (LGDs):** **LGDs** are **identical to natural diamonds** in terms of physical properties such as **hardness, sparkle, and durability** but are created artificially in laboratories using **Graphite as a diamond seed**.
- **Fullerene:** **Buckminsterfullerene** is a type of **fullerene** with the formula C_{60} and is characterised by its distinctive **cage-like structure** resembling a football.
- **Applications:** Fullerenes and their compounds have potential applications as **semiconductors, superconductors, lubricants, catalysts, electric wires, and plastic reinforcing fibres**.
- **Carbon Nanotubes:** They are **cylindrical structures** made of rolled-up **graphene sheets**.
- They are used in electronics, **materials science, energy storage**, medical applications, sensors, **water purification, drug delivery**, aerospace, and **nanotechnology**.
- They can be used as **carriers of drugs and antigens** in the human body and **biochemical sensors**.
- They are **biodegradable in nature**.
- **Amorphous Carbon:** It refers to various forms of carbon **lacking a crystalline structure**, such as **charcoal, soot, and activated carbon**.

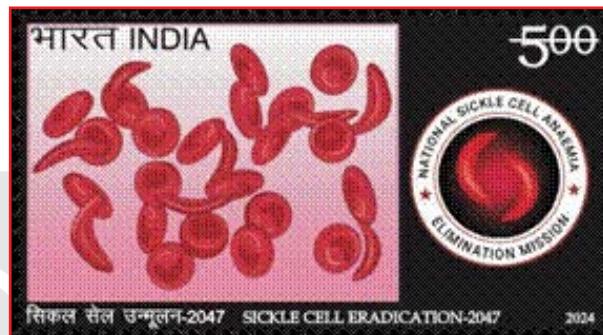


Sickle Cell Eradication

Why in News?

Recently, on **Janjatiya Gaurav Diwas** (15th November 2024), a commemorative postage stamp on **"Sickle Cell Eradication - 2047"** was unveiled in Madhya Pradesh.

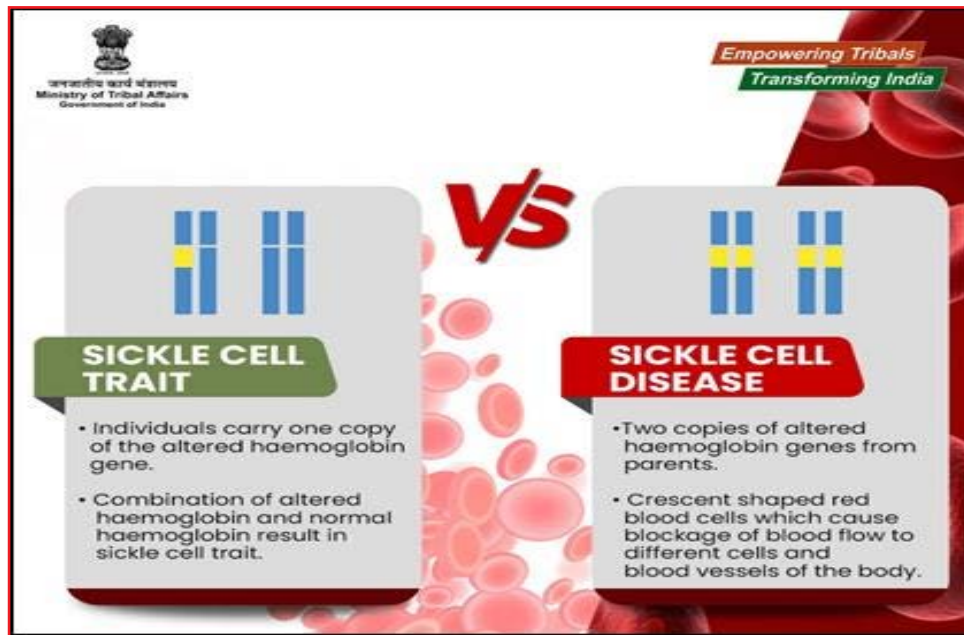
- The initiative aligns with India's broader commitment to eradicating **sickle cell anemia**, a hereditary blood disorder, by 2047, particularly focusing on **tribal communities**, which are disproportionately affected.



What is Sickle Cell Anemia?

- **About:**
 - **Sickle Cell Disease (SCD)** is a **genetic blood disorder** causing abnormal **haemoglobin** (the protein that carries oxygen through the body), resulting in **sickle-shaped red blood cells**.
 - This leads to blocked blood flow, severe pain, organ damage, and reduced life expectancy.
 - The **Ministry of Health and Family Welfare (MoHFW)** tribal health expert committee has identified SCD as one of the ten major health issues among tribal communities.
- **Symptoms:** Some common symptoms of sickle cell disease are
 - **Chronic anaemia** which leads to fatigue, weakness, and paleness.
 - Painful episodes (also known as sickle cell crisis) cause sudden and intense pain in the bones, chest, back, arms, and legs.
 - Delayed growth and puberty.

Note:

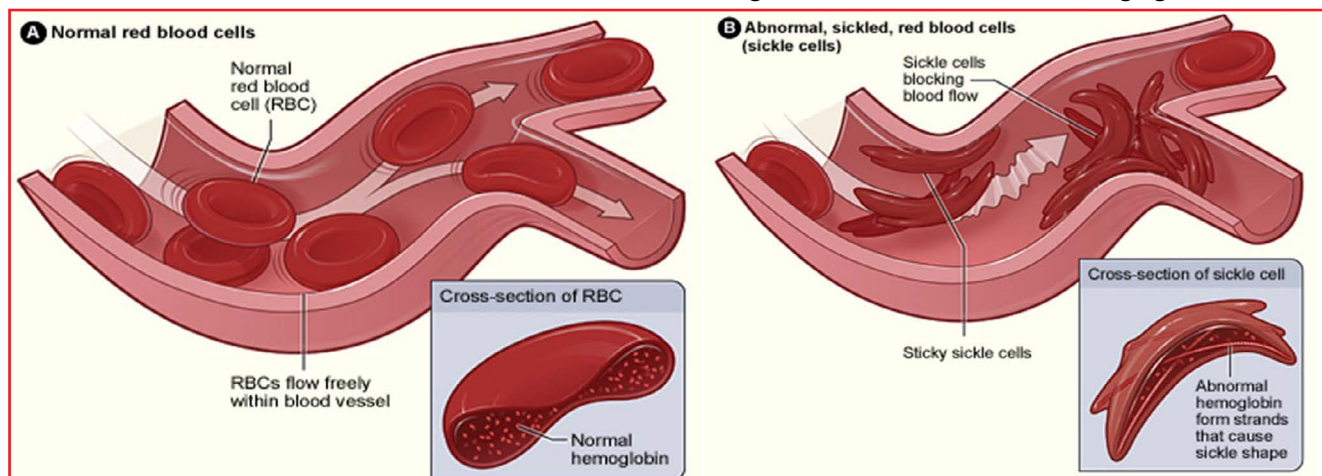


➤ **Treatment Processes:**

- **Blood Transfusions:** These can help relieve **anaemia** and reduce the risk of pain crises.
- **Hydroxyurea:** It can help reduce the frequency of painful episodes and prevent some of the disease's long-term complications.
- **Gene Therapy:** It can also be treated by bone marrow or stem cell transplantation by methods like **Clustered regularly interspaced short palindromic repeats (CRISPR)**.

➤ **Challenges Regarding SCD in India:**

- India has the **world's highest tribal population** density, with 67.8 million people (8.6%) as per the **2011 Census**.
 - **MoHFW** highlights SCD among the top ten health issues impacting tribal communities disproportionately.
- **Limited diagnostic and treatment facilities** in remote tribal areas and lack of knowledge among communities about genetic counseling and preventive measures.
- **Long-term SCD management** can be **financially taxing** due to medication costs, regular check-ups, and hospitalisations.
 - Treatments like **CRISPR cost USD 2-3 million**, and finding bone marrow donors is challenging.



Note:

What are Some Government Initiatives Related to SCD?

➤ National Sickle Cell Anaemia Elimination Mission:

- **Vision:** The [National Sickle Cell Anaemia Elimination Mission](#), announced in the [Union Budget 2023](#), targets the health challenges posed by Sickle Cell Disease (SCD), especially among tribal populations.
 - The mission **aims to eliminate SCD** as a public health issue in India **by 2047**.
- **Key Features:**
 - **Community Screening:** Identification of at-risk individuals through mass screening programs.
 - **Genetic Counselling:** Educating families about the genetic nature of the disease.
 - **Advanced Diagnostics:** Use of tools like **HPLC (High-Performance Liquid Chromatography) machines** for accurate diagnosis.

- **Prenatal Testing:** Collaboration with organisations like **Sankalp India** for testing during pregnancy.
- **Newborn Screening:** Specialised labs at **AIIMS Bhopal** for early detection.
- **Technology Integration:** Development of a **mobile app** and [National Sickle Cell Portal](#) for tracking and data reporting.

○ Objectives:

- **Affordable and Accessible Care:** Provide care to all SCD patients.
- **Quality of Care:** Ensure high-quality care for SCD patients.
- **Reduce Prevalence:** Decrease the prevalence of SCD.

○ Progress:

- Over **3.37 crore individuals have been screened** under the program, with more than 3.22 crore confirmed negative for sickle cell disease.



○ Beneficiaries:

- Primary target groups include **children and adolescents (birth to 18 years)** for early detection and intervention, and **youth and adults (up to 40 years)** for broader age group inclusion over time.
- **Over 7 crore individuals** targeted for screening, counseling, and care within the **first three years (2023-24 to 2025-26)**.

➤ National Health Mission (NHM) 2013:

- It encompasses **provisions for disease prevention** and management, with a specific focus on hereditary anomalies such as **sickle cell anaemia**.
- Dedicated programs within **NHM focus on raising awareness**, facilitating early detection, and ensuring timely treatment of sickle cell anaemia.

Note:

- NHM facilitates drugs like **hydroxyurea** to treat **SCD** in its “essential medicines List”.
- **The National Guidelines for Stem Cell Research 2017:**
 - It restricts the commercialisation of stem cell therapies to clinical trials, **except for Bone marrow transplantation (BMT) for SCD**.
 - Gene editing on stem cells is permitted only for in-vitro studies.
- **National Guidelines for Gene Therapy Product Development and Clinical Trials 2019:**
 - It **provides guidelines** for the development and clinical trials of gene therapies for inherited genetic disorders.
 - India has also approved a **five-year project** to **develop CRISPR (clustered regularly interspaced short palindromic repeats) techniques** for sickle cell anaemia treatment.
 - **State Haemoglobinopathy Mission of Madhya Pradesh** aims to address the challenges in screening and management of the disease.

World Sickle Cell Awareness Day

- World Sickle Cell Awareness Day is observed annually on 19th June. In 2024, the theme is “**Hope Through Progress: Advancing Sickle Cell Care Globally.**”
- The day aims to highlight the struggles faced by those with SCD, promote understanding of the disease, and streamline efforts towards improving patient care and finding a cure.

Indian Equatorial Electrojet Model

Why in News?

- Recently, scientists from the **Indian Institute of Geomagnetism (IIG), Navi Mumbai** have developed the **Indian Equatorial Electrojet (IEEJ) Model** to accurately predict the **Equatorial Electrojet** over the Indian sector.
- Ground-based magnetometers at **Tirunelveli station**, near India’s southern tip, are used for regular EEJ measurements.

What are the Key Facts About Equatorial Ionospheric Processes?

- **Equatorial Electrojet:** It is a **concentrated, intense electric current** flowing within the **Earth’s ionosphere** at the **geomagnetic equator** at a height of around **105-110 km**.
 - India’s **southern tip** is close to the Earth’s geomagnetic equator where a **strong current exists**.
- **IEEJ Model Capabilities:** It has a **web interface** that allows simulations of EEJ for different dates and **solar activity conditions**.
- **Applications:** The model helps in understanding **equatorial ionospheric processes** and has practical applications in several ways:
 - **Satellite** orbital dynamics
 - **Global Navigation Satellite Systems (GNSS)**-based navigation/positioning
 - Satellite communication links
 - Electrical power grids
 - Transmission lines
 - Oil and gas industry pipelines

Note: The **geomagnetic equator** is the **midpoint** between the **magnetic north and south poles**, running around the Earth.

- Unlike the geographic equator, it can **shift and change position** due to variations in the **Earth’s magnetic field**.

Ionosphere

- It is **not a distinct layer** like the Troposphere or Stratosphere. Instead, the ionosphere **overlaps** the **mesosphere, thermosphere, and exosphere**.
- It’s a very active part of the atmosphere, and it **grows and shrinks** depending on the energy it absorbs from the sun.
 - It is an electrically conducting region capable of **reflecting radio signals** back to Earth.
- The **electrically charged atoms and molecules** that are formed in this way are called **ions**, giving the ionosphere its name.

Note:



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What is the Division of Atmosphere Based on Thermal and Chemical Composition?

➤ Thermal Composition of Atmosphere:

ATMOSPHERE AND ITS LAYERS



ATMOSPHERE

- One of the main components of Earth's interdependent physical system
- It is composed of about 78% nitrogen, 21% oxygen, and 1% other gases

LAYERS

Troposphere:

- Extends from Earth's surface upto 12 kilometers
- The **lowest part of the atmosphere**-the part we live in
- Temperature in the troposphere decreases with height
 - The top of the troposphere is called **tropopause**
- Densest atmospheric layer
- Contains about **75% of all of the air in the atmosphere**, and 99% of water vapour (which forms clouds and rain)

Stratosphere:

- Located between 12 and 50 kilometers above Earth's surface
- Contains much of the **ozone** in the atmosphere
 - Ozone molecules in this layer **absorb ultraviolet (UV) radiation** from the Sun, resulting in an increase in temperature
- It is nearly cloud- and weather-free
- It's the highest part of the atmosphere that jet planes can reach

Mesosphere:

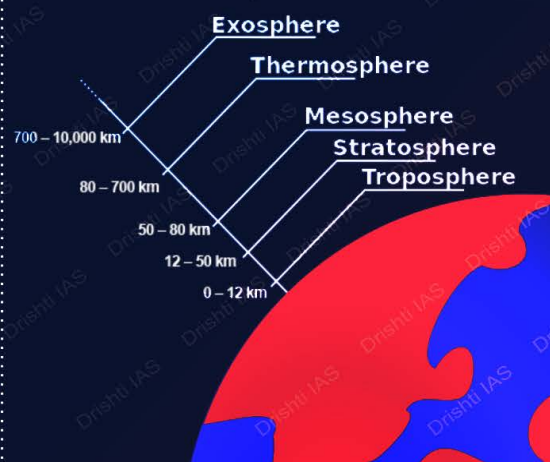
- Located between about 50 and 80 kilometers above Earth's surface
- The top of this layer is the **coldest place found within the Earth system**
- It forms **noctilucent clouds**, the highest clouds in Earth's atmosphere
- Most **meteors burn up** in this atmospheric layer
- Sounding rockets and rocket-powered aircraft** can reach the mesosphere

Thermosphere:

- Located between about 80 and 700 kilometers above Earth's surface
- Its **lowest part contains the ionosphere**
- The **temperature of the thermosphere varies between night and day and between the seasons**
- The **aurora borealis (northern) and aurora australis (southern)** are sometimes seen here

Exosphere:

- Located between 700 and 10,000 kilometers above Earth's surface.
- The **highest layer of Earth's atmosphere**.
- There's **no weather at all** in this layer.
- Most Earth **satellites orbit in this layer**.
- At the bottom of the exosphere is a transition layer called the **thermopause**.



Note:

- **Chemical Composition of Atmosphere:** On the basis of **chemical composition**, the atmosphere is divided into **two broad zones**.
 - **Homosphere:** Homosphere can be defined as the **lowest part** of the Earth's atmosphere. It lies between the heterosphere and the surface of the earth.
 - It is the earth's atmosphere below the altitude of **roughly 90 kms** where there is an **almost-homogenous** composition of **nitrogen (78%), oxygen (21%), argon (10%), carbon dioxide** as well as traces of constituents like **dust particles, aerosols and cloud droplets**.
 - It is divided into the Troposphere, Stratosphere and Mesosphere.
 - **Heterosphere:** The **atmosphere laying beyond the homosphere** is termed as heterosphere. It extends from **90 km to 10,000 km**.
 - The air is **rare** and the **molecules** are **wide apart**. The mixing of the gases is not possible as the **turbulence is not happening there**.
 - It is divided into two main spheres i.e., **thermosphere and exosphere**.

Regulatory Framework for Laboratory-Grown Meat

Why in News?

Recently, the **Food Safety and Standards Authority of India (FSSAI)** is planning to put a **regulatory framework** for **laboratory-grown meat**, dairy, and egg products.

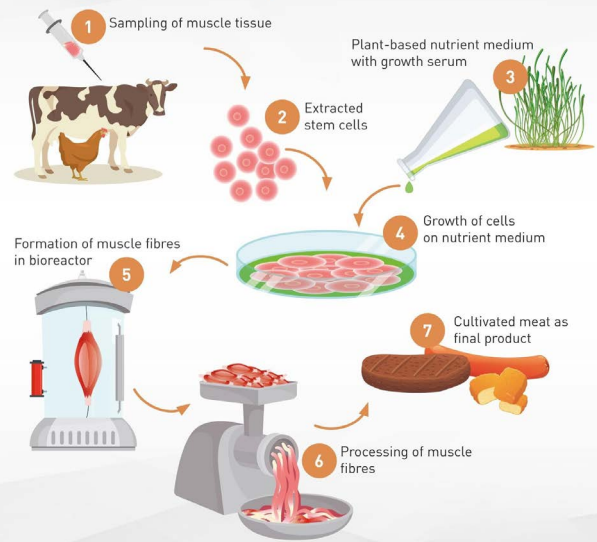
- FSSAI regulates **plant-based protein products**, but **lab-grown** and fermentation-derived proteins have no clear regulations.

What is Laboratory-Grown Meat?

- **About:** Lab-grown meat is **produced in laboratories** using cells from **living animals or fertilised eggs**, rather than coming from slaughtered animals.
 - It is also known as **cultured meat or cultivated meat**.
- **Production Process:**
 - **Cell Extraction:** The process begins by **extracting cells** from living animals.
 - **Growth Medium:** The cells are then placed into a **mixture** containing **amino acids, fatty acids, sugars, salts, vitamins**, and other essential nutrients.
 - **Cultivation:** These cells grow into **larger masses**, eventually forming **muscle tissue** that resembles **traditional meat**.
- **Current Market Availability:** The US, the EU, Singapore and Israel have issued regulations for cultivated and fermentation-derived protein.

- **Environmental Impact:** Lab-grown meat is considered to be **more environmentally friendly** than conventional meat production.
 - Early studies suggest that lab-grown meat requires **45% less energy**, uses **99% less land**, and **produces 96% fewer greenhouse gas emissions** compared to beef.

Cultivated meat production



Plant-Based Meat

- **About:** **Plant-based meat** is a meat **alternative** made from **plant ingredients** that replicates the **taste, texture, and appearance** of actual animal meat (such as sausage, and chicken) without using any animal products.

Note:

- **Ingredients:** Plant-based meat is made primarily from **vegetables, grains, and legumes**.
 - Common ingredients include **protein sources** like tofu, tempeh, soy, and peas, as well as **plant oils** (e.g., sunflower, canola) and **vegan binding agents** (e.g., flour, aquafaba, beans).
- **Processing:** Plant-based meat manufacturers use advanced technologies like **extrusion** and **wet texturization** to enhance the **texture** and consistency of the product.
 - **Heat and mechanical pressure** make plant products more **meat-like**, creating **stringy or sinewy textures** similar to animal meat.

What is the Need to Regulate Laboratory-Grown Meat in India?

- **Public Health Concerns:** Regulating lab-grown meat can help reduce the risks of **zoonotic diseases** like **bird flu, swine flu, and Covid-19** by ensuring safety and quality standards.
- **Ecological Sustainability:** Lab-grown meat is a **sustainable alternative**, using less land, water, and energy, and emitting fewer **greenhouse gases**.
 - Clear regulations are needed to ensure sustainable production and maximise environmental benefits..
- **Market Development:** India has **over 15 companies** working on **cultivated meat** with several **start-ups** preparing to launch these products and seek regulatory approvals.
 - Companies need clear standards for **quality, labelling, and marketing** of lab-grown meat to build consumer trust and ensure food safety compliance.
- **Potential for Growth:** Experts said that lab-grown meat could **capture 10-15%** of the traditional animal meat industry's market share as **younger and more environmentally-conscious** generations may show interest.
- **Ethical Considerations:** Lab-grown meat, which is cultivated from **animal cells** without the need for **slaughter**, addresses growing concerns over **animal cruelty** in traditional meat production.
- **Global Competitiveness:** As countries like the **US, EU, Singapore, and Israel** already have **regulatory frameworks** in place for cultivated and fermentation-derived proteins, **India risks falling behind** in this emerging industry without a clear regulatory stance.

India's Meat Market

- India has the **world's largest** livestock population.
 - The country is the **largest producer of buffalo meat, 2nd largest producer of goat meat, and ranks 5th in poultry** meat production.
- In **2022-23**, India produced around **2.1 million tonnes of cattle**, 13.6 million tonnes buffaloes, 73.7 million tonnes sheep, 9.3 million tonnes pigs and **331.5 million poultry** meat.
- India's **exports** of animal products in **2023-24** was worth **USD 4.5 billion**, which included **buffalo meat worth USD 3.7 billion, poultry meat worth USD 184.58 million, and sheep or goat meat of USD 77.68 million**.
- Indian Council of Agricultural Research (ICAR)-**Central Marine Fisheries Research Institute (CMFRI)** has undertaken a research project to develop **lab-grown fish meat**.

Food Safety and Standards Authority of India

- FSSAI is an **autonomous statutory body** established under the **Food Safety and Standards Act, of 2006**.
- The Act of 2006, **consolidates various laws** related to food, such as the **Prevention of Food Adulteration Act, 1954, the Fruit Products Order, 1955, the Meat Food Products Order, 1973**, and other acts that were previously handled by different ministries and departments.
- FSSAI is responsible for **protecting and promoting public health** by regulating and supervising food safety and quality in India, operating under the **Ministry of Health & Family Welfare**.
- The **Chairperson and Chief Executive Officer** of FSSAI is appointed by the central government. The Chairperson is in the **rank of Secretary** to the Government of India.

What are the Challenges in Promotion of Laboratory-Grown Meat?

- **Regulatory Uncertainty:** The lack of a clear regulatory framework for lab-grown meat creates uncertainty, **confusing manufacturers and investors** and hindering sector growth.
 - Scaling up production to a mass level remains a significant challenge as **no country** has been able to **scale up production at a mass scale**.

Note:

- **Dietary Preferences:** In India, food habits are shaped by cultural, religious, and social factors, with many avoiding both meat and meat-like products.
 - While lab-grown meat may mimic taste and texture, it lacks equivalent nutrition.
 - A survey revealed that **73%** of Indians are protein-deficient, and over **90%** are unaware of their daily protein needs.
- **Lack of Consumer Awareness:** The concept of laboratory-grown meat is still **relatively new** in India. People who are **meat eaters** may give it a **try but not continue it for long**.
- **Environmental Impact:** Lab-grown meat production is **highly energy-intensive**, using **4 to 25 times** more energy than retail beef, raising concerns about its long-term environmental impact, especially in resource-constrained countries like India.
- **Resistance from Traditional Meat Industry:** Lab-grown meat faces resistance from India's traditional meat industry, which sees it as a threat to small-scale farmers' livelihoods.
 - Additionally, **limited market acceptance** persists as many Indian consumers prefer traditional meat for its familiar taste, texture, and affordability.

Jeddah Commitments on AMR

Why in News?

Recently, the **4th Global High-Level Ministerial Conference on Antimicrobial Resistance (AMR)** concluded in Jeddah, Saudi Arabia, with the adoption of the **Jeddah Commitments**.

- Jeddah Commitments laid down **practical, actionable and cross-sectoral steps** stakeholders to address AMR-related goals by **2030**.
- Its theme was **"From Declaration to Implementation – Accelerating Actions Through Multisectoral Partnerships for the Containment of AMR."**

What are the Key Initiatives in Jeddah Commitments?

- **Establishment of New Hubs:** It announced an **AMR 'One Health' Learning Hub** and a regional **Antimicrobial**

Access and Logistics Hub in Saudi Arabia to enhance access to **essential antimicrobials and diagnostics**.

- **Biotech Bridge Initiative:** It calls for the creation of a new **'biotech bridge'** aimed at boosting **research, development and innovation** to find solutions to the global threat.
- **Quadripartite Joint Secretariat (QJS) on AMR:** It highlighted the role of QJS on AMR which aims to bolster efforts to **prevent and reduce the rise of AMR**.
- **Other Key Actions:**
 - Establishment of an **Independent Panel for Evidence on Action Against AMR** by 2025.
 - Creation of operational **national AMR coordination mechanisms**.
 - Promotion of **global data sharing** through platforms like GLASS AMR/AMC, ANIMUSE, and INFARM.
 - Adherence to **Codex Alimentarius Commission** guidelines for responsible antimicrobial use.

What are the Key Points about QJS on AMR?

- **About:** QJS on AMR is a collaborative effort between four key international organisations i.e., **FAO, UNEP, WHO, and the World Organization for Animal Health (WOAH)** to address the global challenge of AMR.
- **Establishment:** It was created following a request from the **United Nations Secretary-General** to the Executive Leaders of the then **Tripartite organisations (FAO, WHO, WOAH)**.
- **Purpose and Role:** It provides **global advocacy, technical guidance, political engagement**, and promotes a **shared vision and goals** for addressing AMR.
 - It acts as the **Secretariat for global governance structures** related to AMR.
- **Hosting and Operations:** It is hosted by the **World Health Organization (WHO)**.
 - It is tasked with implementing the recommendations of the **Inter-agency Coordinating Group on AMR (IACG)**.

What are Key Points about AMR?

- **About AMR:** **AMR** occurs when pathogens (**bacteria, viruses, fungi, parasites**) evolve to resist the effects of antimicrobial medicines, making **treatments ineffective** and increasing risks of severe illness, disease spread, and death.
 - **Resistant pathogens** are termed as **superbugs**.

Note:



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- **Causes of AMR:** AMR is a **natural process** in pathogens, but human activities like **misusing and overusing** antimicrobials speed up its spread.
 - **Excessive Use:** Over-prescribing antibiotics for viral infections.
 - **Inappropriate Use:** Taking antibiotics without supervision or using the wrong ones.
 - **Self-medication:** Using leftover or unprescribed antibiotics.
 - **Subtherapeutic Dosing:** Taking insufficient antibiotic doses, allowing bacteria to adapt.
 - **Routine Use in Animals:** Antibiotics are used in livestock to promote growth or prevent disease, not just for infections.
 - **Spread to Humans:** Resistant bacteria can transfer to humans through meat consumption or contact with animals.
- **Economic Costs:** The **World Bank** estimates AMR could add **USD 1 trillion** in healthcare costs by **2050** and cause annual **GDP** losses of **USD 1 trillion** to **USD 3.4 trillion** by **2030**.

ANTIMICROBIAL RESISTANCE

The ability of microorganisms to resist the effects of antimicrobial drugs

CAUSES OF ↑ AMR

- Poor infection control/sanitation
- Antibiotic overuse
- Genetic mutations of microbe
- Lack of investment in R&D of new antimicrobial drugs

Microbes that develop AMR are called 'Superbugs'

RECOGNITION BY WHO

- Identified AMR as **one of the top 10** threats to global health
- Launched **GLASS** (Global Antimicrobial Resistance and Use Surveillance System) in 2015

IMPACTS OF AMR

- ↑ Risk of spreading infections
- Makes infections harder to treat; prolonged illness
- ↑ Healthcare costs

INDIA'S INITIATIVES AGAINST AMR

- Surveillance of AMR in microbes causing **TB**, **Vector Borne diseases**, **AIDS** etc.
- **National Action Plan on AMR (2017)** with One Health approach
- **Antibiotic Stewardship Program** by ICMR

EXAMPLE

- Carbapenem antibiotics stop responding due to AMR in *K. pneumoniae*
- AMR *Mycobacterium tuberculosis* causing Rifampicin-Resistant TB (RR-TB)
- Drug-resistant HIV (HIVDR) making antiretroviral (ARV) drugs ineffective

New Delhi metallo-β-lactamase-1 (NDM-1) is a bacterial enzyme, emerged from India, that renders all current β-lactam antibiotics inactive

What are the Key Findings of the Study?

- The Moon's far side, like the near side, experienced volcanic eruptions billions of years ago, with rock fragments dating back **2.8 to 4.2 billion years**, confirming widespread **lunar volcanism**.
- Data from the **National Aeronautics and Space Administration (NASA) Lunar Reconnaissance Orbiter** and prior studies had hinted at **volcanic activity on the far side**, but this study offers the first physical evidence.
- These eruptions lasted over a **billion years**, and future research aims to understand the duration and causes.
- The **far side is less flat and lacks the large lava plains** seen on the near side, which raises questions about why the two sides have such different geological features.
- These findings are significant as they enhance understanding of the Moon's geological history and may explain the **differences between the far side and the near side**.

Far Side of the Moon

- The **moon is tidally locked to Earth**, meaning it takes 27.3 days to rotate once and the same time to orbit Earth. This causes the same side of the Moon to always face Earth, while the other side, known as the far side, remains hidden.

What is China's Chang'e-6 Mission?

- **Chang'e Program:** Named after the Chinese goddess of the moon, the **Chang'e** missions are part of **China's Lunar Exploration Program (CLEP)**, initiated in 2003 by the **China National Space Administration (CNSA)**.

Volcanism on the Far Side of the Moon

Why in News?

A new study published in the journal **Nature and Science** reveals that **volcanic eruptions** occurred on the moon's far side, based on samples from **China's Chang'e-6 mission**, shedding light on lunar geology.

Note:



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- The Chang'e series aims to deepen understanding of the moon and its geological history.
- **Chang'e-6 Mission:** China's Chang'e-6 mission successfully landed on the far side of the Moon, specifically in the **South Pole-Aitken Basin, which is one of the Moon's oldest and largest craters.**
- The mission aimed to collect nearly 2 kilograms of lunar material. The samples were retrieved from the surface of the Moon and returned to Earth to study the **differences between the near and far sides of the Moon.**

India's Far Side Lunar Plans: India plans to launch the **Chandrayaan-4** lunar sample-return mission in 2028 but has **no current plans to explore the far side of the moon.** However, as a signatory of the **Artemis Accords**, India is expected to collaborate on future lunar exploration missions.

CHANDRAYAAN 3

India's 3rd lunar mission; a successful attempt at achieving a soft landing on lunar south

BRIEF HISTORY

Lunar Mission	Aim	Launch Vehicle	Success
Chandrayaan 1 (2008)	Create a 3D atlas of moon & Mineralogical mapping	PSLV – C11	Detection of water and hydroxyl on lunar surface
Chandrayaan 2 (2019)	Exploring lunar south pole	GSLV MkIII-M1	Lander and rover crashed but orbiter successfully collected data



COMPONENTS

- Lander - **Vikram**; Rover - **Pragyan** (same as Chandrayaan 2)
 - ▶ Both designed to last for 14 days; not supposed to come back to the earth
- Spectro-polarimetry of Habitable Planet Earth (**SHAPE**)
 - ▶ An experimental payload in propulsion module
 - ▶ Study spectro-polarimetric signatures of Earth (near-infrared wavelength range)

India became the 1st country to successfully land on Lunar south pole and 4th to achieve soft-landing on Lunar surface (after US, Russia and China)

ASPECTS TO STUDY

- Lunar quakes
- Thermal properties of lunar surface
- Changes in plasma near the surface
- Accurately measuring distance b/w Earth and the moon

Why Chandrayaan 3 Succeeded?

- A "failure-based design", unlike the "success-based design" of Chandrayaan-2
 - ▶ Even if all the sensors failed and engines stopped, **Vikram was sure to make the landing**
 - ▶ Provision of **multiple attempts** for landing if attempt 1 failed
- Developed accordingly to **rule out the scenario of crash landing**
 - ▶ Expanded landing area for more flexibility to land safely
 - ▶ Equipped with more fuel to enable longer-distance travel

MISSION LIFE

- 1 lunar day (~14 Earth days)

Importance of Lunar South Pole

- Vastly different, more **challenging terrain** compared to lunar equatorial region
- Potential repositories of valuable **information about early Solar System**
- Impact **future deep space exploration** significantly
- **Water may be concentrated** in the moon's southern hemisphere

LAUNCH VEHICLE

- LVM3 - M4





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Note:

Black Hole Triple System

Why in News?

A recent study has discovered the **first black hole triple system**, located **8,000 light-years (LY)** away (LY is the distance light travels in a year, **approx 5.9 trillion miles (9.5 trillion km)**, differing from **typical black holes**, usually found as isolated entities or in binary systems.

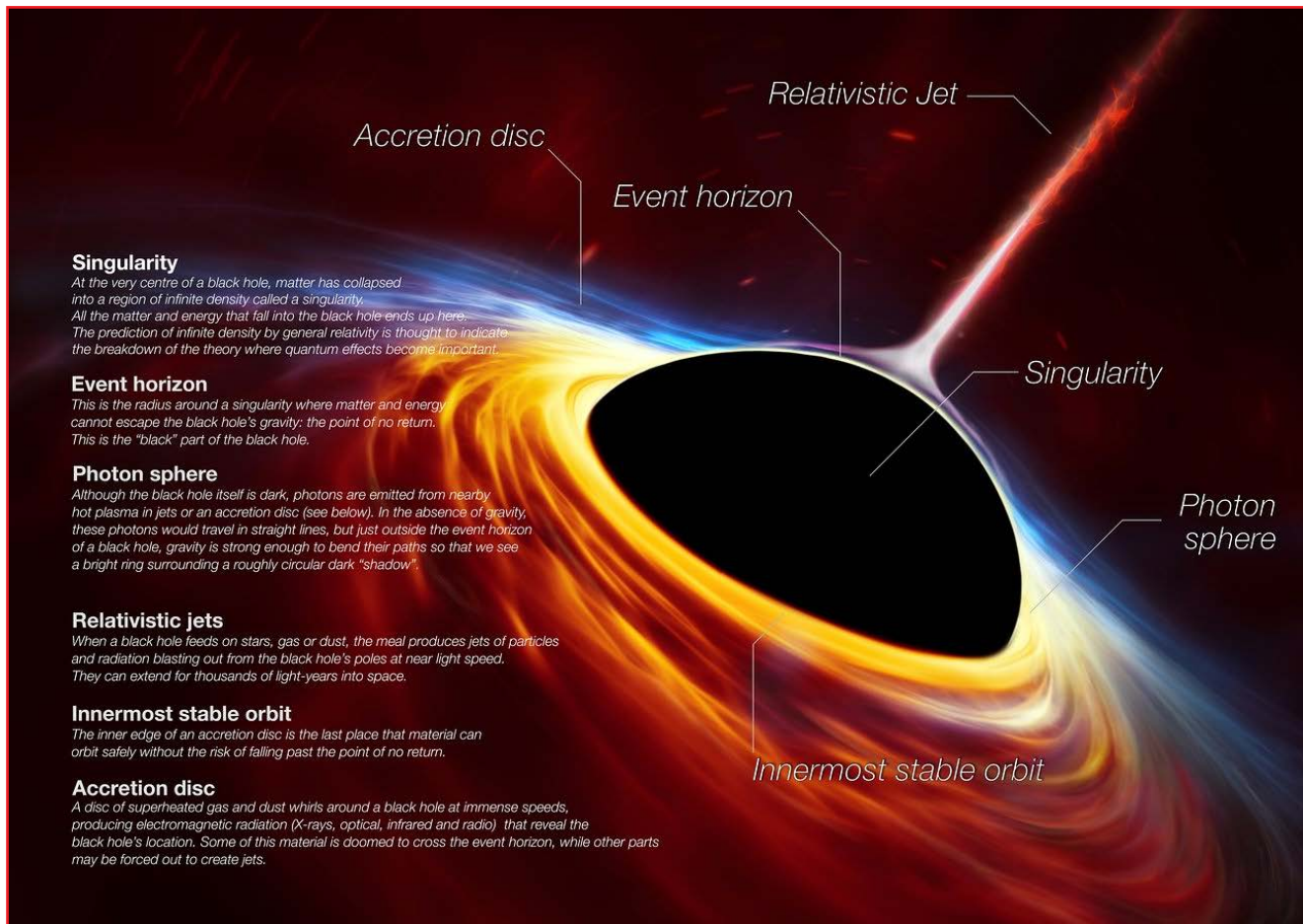
What is a Black Hole Triple System?

- **About:** A black hole triple system consists of a central black hole and two orbiting stars, bound together by gravitational forces.
 - It forms through a **“direct collapse” process**, where a massive star collapses inward **without undergoing a supernova explosion**, enabling nearby stars to remain gravitationally attached.
 - The process of **direct collapse**, also termed a **“failed supernova”**, creates a gentler formation mechanism, avoiding the **violent ejection of surrounding matter**.
 - This unique structure challenges traditional models of black hole formation and demonstrates the complex gravitational dynamics that can exist in stellar systems.

Difference Between a Black Hole and a Black Hole Triple System		
Feature	Black Hole	Black Hole Triple System
Components	A singular black hole.	One central black hole (V404 Cygni) and two stars.
Orbital Details	No other celestial body is necessarily bound to the black hole.	<ul style="list-style-type: none"> ➤ One star orbits every 6.5 days. ➤ Another star orbits every 70,000 years.
Location	Found across the universe.	Located about 8,000 light years away in the constellation Cygnus .
Unique Features	Often found in isolation or binary systems.	Features gravitationally linked stars in a rare triple configuration.
Behaviour	May consume nearby matter and emit X-rays .	The central black hole consumes the nearer star over time .
Scientific Implications	Supports standard models of black hole formation and stellar evolution.	Challenges traditional black hole formation theories and provides insights into complex gravitational dynamics.
Discovery Context	Commonly studied through telescopic data.	Accidentally discovered while analysing astronomical data of V404 Cygni .

Black Hole
<ul style="list-style-type: none"> ➤ A region in space with gravity so strong that no matter or light can escape. Typically forms from the collapse of a massive star in a supernova. ➤ Types of Black Holes: <ul style="list-style-type: none"> ○ Stellar Black Hole: It is formed by the collapse of a single massive star ○ Intermediate Black Hole: Their masses are between 100 and 100,000 times that of the sun. ○ Supermassive Black Hole: Their masses ranging from millions to billions of times that of the sun, found at the centres of most galaxies including our own Milky Way galaxy.

Note:



Note:

Environment and Ecology

Highlights

- Bioplastics
- Discrepancies in Satellite Data on Farm Fires
- Cloud Seeding to Reduce Air Pollution
- UNFCCC COP29 Baku
- Avian Botulism at Sambhar Lake
- Carbon Credits
- Tackling Air Pollution
- Guru Ghasidas-Tamor Pingla Tiger Reserve

Bioplastics

Why in News?

In February 2024, Balrampur Chini Mills, Uttar Pradesh one of India's leading sugar producers, announced a Rs 2,000 crore investment in **India's first bioplastics factory** to produce **Bioplastics**.

- This project is expected to play a pivotal role in **diversifying the sugar industry** and contributing to environmental sustainability by introducing **biodegradable alternatives** to **petroleum-based plastics**.

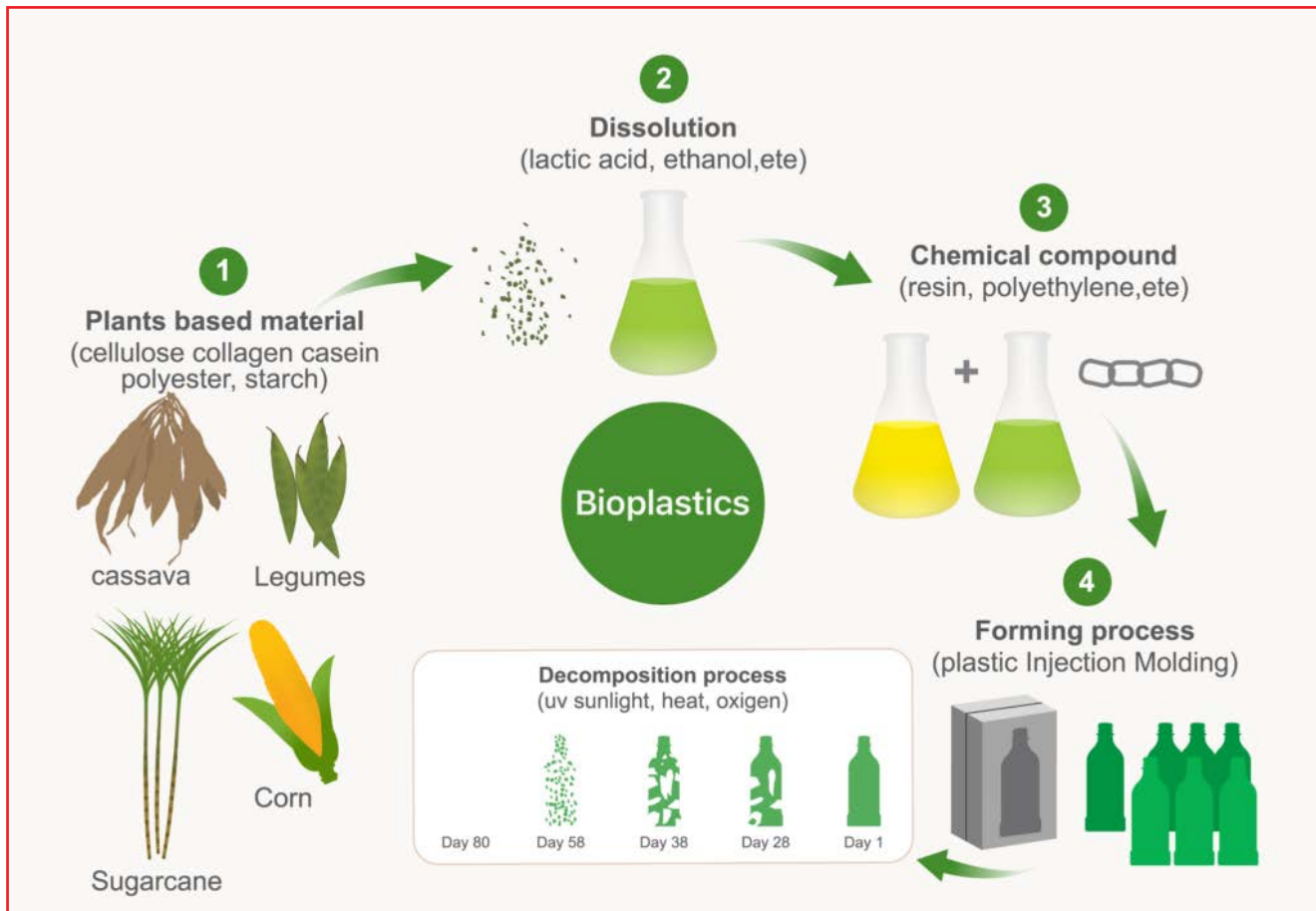
What are Bioplastics?

- **About:** Bioplastics are derived from **renewable organic** sources like **sugarcane, corn**, unlike traditional plastics made from petroleum. They are **not always biodegradable or compostable**.
 - Bioplastics are produced by **extracting sugar from plants like corn and sugarcane** and converting it into **polylactic acids (PLAs)**. Alternatively, they can be made from **polyhydroxyalkanoates (PHAs)** from microorganisms which are then **polymerized** into **bioplastic**.
- **Advantages of Bioplastics:** For sugar companies, bioplastics offer a new revenue stream beyond **traditional sugar production and ethanol**. The bioplastics project is expected to generate Rs 1,700 crore to Rs 1,800 crore annually.
 - The production of Bioplastics absorbs **carbon dioxide (CO₂)** and contributes to a **neutral or potentially**

negative carbon balance, helping reduce the **carbon footprint** compared to fossil-based plastics.

- Unlike traditional plastics, bioplastics do not contain harmful chemicals such as **phthalates**, which are known to be hazardous to human health.
- Bioplastics are as **strong and durable as traditional plastics**, making them ideal for use in a variety of applications such as **food packaging, agricultural films, and medical supplies**.
- The use of renewable resources for bioplastic production helps reduce reliance on **non-renewable materials like petroleum**.
- **Challenges:** While bioplastics offer many advantages, the **technology is still developing**, and the **cost of production can be higher than that of traditional plastic**.
 - The supply of raw materials, such as **agricultural waste, may also be limited in some regions**.
 - Concerns exist over **India's sugar industry meeting rising sugarcane demand**, as bioplastic production competes with **sugar and ethanol needs**. With a projected **4 million tonne decrease in sugar production in 2024-25**, balancing these demands will be a challenge.
- **Future Outlook for Bioplastics:** Continued innovation in bioplastic production processes and materials will help reduce costs and improve scalability.
 - Securing a steady supply of raw materials, such as **agricultural waste and sugarcane**, will be crucial for meeting growing demand.
 - Consumer demand for **sustainable products and packaging** will drive the adoption of bioplastics, especially in environmentally conscious markets.

Note:



Discrepancies in Satellite Data on Farm Fires

Why in News?

Recently, the [Supreme Court \(SC\) of India](#) highlighted discrepancies in [farm fire data collected by satellites](#), which is provided by the [Commission for Air Quality Management \(CAQM\)](#). This data is crucial for monitoring [air quality](#), especially in regions like Delhi, Punjab and Haryana.

- In response, the [Indian Space Research Organisation \(ISRO\)](#) acknowledged gaps in the existing satellite data and committed to developing in-house algorithms to analyze data on Farm Fires more accurately.

What are the Issues with Current Satellite Data on Farm Fires?

- **Accuracy of Data:** The data from [National Aeronautics and Space Administration \(NASA\)](#) polar-orbiting

satellites, is insufficient for accurately counting farm fires.

- This is mainly due to their **limited observation window period** over the regions of Haryana and Punjab.
- The current satellites, including [India's INSAT-3DR](#) provide low-resolution images that are inadequate for accurately counting farm fires.
 - This issue is compounded by the **lack of calibration and validation** of these data sets specifically over India.
- Climatic conditions, particularly **cloud cover and water vapor**, can obstruct satellite sensors, hindering accurate readings and data acquisition.
 - Additionally, **seasonal changes and time-of-day discrepancies** affect the effectiveness of fire detection thresholds, creating **hurdles for consistent monitoring**.
- **Evasion by Farmers:** Farmers are **reportedly timing their stubble burning activities to avoid satellite detection**.

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They often conduct burns **after the satellites have passed the region**, knowing the observation windows.

- This results in an **undercount of farm fires in the official data**. This raises concerns about the accuracy of the data used by government agencies for monitoring farm fires.
- **Inconsistent Reporting:** Despite concerns raised by the SC, the **CAQM** has not yet made necessary data adjustments public, leading to questions about transparency and the real scope of the **stubble-burning issue**.

What is the Need for Accurate Farm Fire Data in India?

- **Impact on Air Quality:** Farm fires, particularly in states like Punjab and Haryana, **contribute to severe air pollution in the National Capital Region (NCR)** and adjoining areas, especially during the winter months.
- **Better Policy Planning:** Accurate data on farm fires can help government agencies take timely actions to **mitigate pollution, regulate farming practices, and implement crop residue management strategies**.
 - Accurate farm fire data can assist in identifying regions with high instances of crop burning, which could prompt interventions such as **promoting alternatives to stubble burning** or providing incentives for **sustainable farming practices**.
- **Health Risks:** The fine **particulate matter (PM2.5)** released by farm fires is a major health hazard. People in areas affected by high pollution levels experience respiratory problems, cardiovascular diseases, and other health issues.
 - Reliable data helps health officials predict and mitigate these risks by coordinating actions across regions.
- **ISRO's Efforts to Improve Satellite Monitoring:** The ISRO has acknowledged that current data processing

algorithms are not suited for accurate fire detection in the Punjab and Haryana regions.

- They are working on developing in-house algorithms to analyze foreign satellite data more effectively.
- ISRO aims to upgrade its satellite, **INSAT-3DS**, by February 2025 to improve its ability to detect farm fires with greater accuracy.
- ISRO is working on improving satellite capabilities with the upcoming **GISAT-1**, but issues with the satellite launch have delayed progress.
 - The use of satellites like **RESOURCESAT-2A**, with higher resolution imaging, could provide better monitoring of farm fires and their impact on air quality.

What are Farm fires?

- **About:** Farm fires usually refer to **deliberate fires set on agricultural fields, primarily after the harvest season to clear crop residue**, particularly in regions practicing **stubble burning**.
 - These fires often involve **burning leftover straw, stubble, or crop residues** to prepare fields for the next planting season quickly.
 - However, farm fires can also occur accidentally due to machinery malfunctions or other unintended causes.
- **Concerns Regarding Farm Fires:** Farm fires can be a cost-effective and time-saving method for farmers, it contributes significantly to **air pollution, emitting large amounts of smoke, particulate matter, and greenhouse gases** into the atmosphere.
 - Burning crop residues leads to the loss of essential nutrients such as nitrogen, phosphorus, potassium, and sulfur, which are vital for **soil fertility**.
- **Crop Residue Management(CRM):** CRM Options can be classified as **in-situ and ex-situ management options**.

In-Situ Crop Residue Management (residues are handled directly in the field)	Ex-Situ Crop Residue Management (removing the residues from the field and using them for other purposes)
<ul style="list-style-type: none"> ➤ Mulching: Leaves crop residue on the soil surface, protecting it from erosion and retaining moisture. <ul style="list-style-type: none"> ○ Suppresses weeds and enriches the soil with nutrients. 	<ul style="list-style-type: none"> ➤ Biomass Power Generation: Burning crop residues to produce electricity or heat, reducing dependency on traditional fuels.

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|---|--|
| ➤ No-Till Farming: Seeds are planted directly into the soil without disturbing the crop residue.
○ It helps conserve moisture and reduces soil erosion. | ➤ Animal Feed: Residues, especially from cereal crops, can be baled and used as animal fodder. |
| ➤ Strip-Till Farming: Involves tilling narrow strips where seeds are planted, leaving crop residue on the soil surface.
○ Reduces soil disturbance and promotes a healthy environment for seed germination. | ➤ Composting: Crop residues are mixed with other organic materials to create nutrient-rich compost that improves soil health. |
| ➤ Crop Rotation: Alternating crops each season to reduce soil depletion and improve soil health. | ➤ Industrial Uses: Crop residues can be converted into products like paper, textiles, and building materials. |

What is the Commission for Air Quality Management?

- **About:** The CAQM in the National Capital Region (NCR) and adjoining areas was established through an ordinance in 2020, later replaced by the **The Commission for Air Quality Management in NCR & Adjoining Areas Act, 2021**.
 - Its main objective is to address air pollution through better coordination, research, and resolution of pollution-related problems, particularly in Delhi and surrounding states.
 - The CAQM replaced the **EPCA (Environmental Pollution (Prevention and Control) Authority)**, which was formed in 1998 by the Supreme Court.
- **Powers of the CAQM:** Issue directions and take necessary measures to improve air quality. Investigate complaints related to air quality and pollution control.
 - Take action against non-compliance by authorities under the provisions of the CAQM Act. Investigate complaints related to air quality and pollution control.
 - It formulates action plans for controlling key pollution sources like **vehicular emissions, industrial activities, and agricultural stubble burning**.
 - One of its key initiatives is the **Graded Response Action Plan (GRAP)**, which implements restrictions based on pollution severity.
- **Graded Response Action Plan:** It is a proactive strategy to tackle air pollution in Delhi-NCR. It includes staged actions based on air quality levels, ensuring timely interventions to reduce health risks and environmental damage during high pollution periods.

- **Stage I (AQI 201-300):** "Poor" air quality, with actions such as stricter enforcement of vehicle regulations.
- **Stage II (AQI 301-400):** "Very Poor" air quality, focusing on hotspot actions and limiting the use of diesel generators.
- **Stage III (AQI 401-450):** "Severe" air quality, involving vehicle restrictions and potential school closures.
- **Stage IV (AQI > 450):** "Severe+" air quality, with stringent entry restrictions for vehicles and possible shutdowns of non-essential businesses and educational institutions.

India's Crop-Residue Management Initiatives

- **Baler Machine**
- **Bio-Decomposer**
- **National Policy for Management of Crop Residue (NPMCR):** In 2014, the Ministry of Agriculture introduced the NPMCR to curb residue burning. Key objectives include:
 - Promoting technologies for **optimal use and in-situ management of crop residues**. Supporting appropriate machinery for farming.
 - Using satellite-based technologies for monitoring and providing financial support through a multidisciplinary approach for innovative projects.

Cloud Seeding to Reduce Air Pollution

Why in News?

Recently, the proposal for **cloud seeding** as a measure to combat air pollution in **Delhi** has gained attention due

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to the acute air quality crisis with the **Air Quality Index (AQI)** exceeding 450.

What is Cloud Seeding?

➤ About:

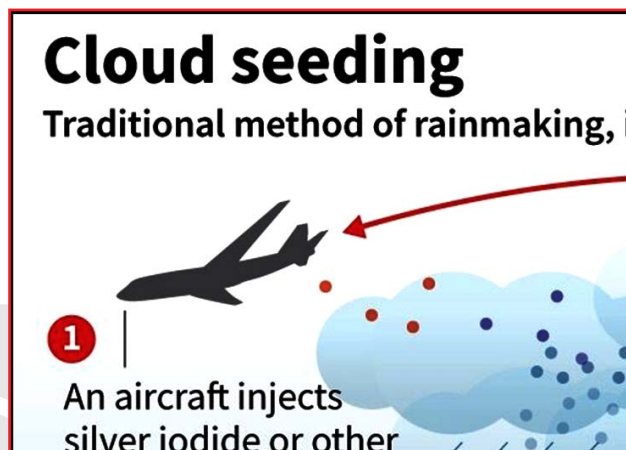
- Cloud seeding, a **weather modification technique**, enhances precipitation by dispersing chemicals like **silver iodide, potassium iodide, or dry ice** into clouds, which serve as nuclei for water droplet formation, leading to rainfall.
- This process facilitates the **formation of ice crystals in clouds**, which can lead to artificial rain.
 - The technique is being considered as a potential solution to combat severe air pollution, particularly during periods of high **Air Quality Index (AQI)** readings.

➤ Types of Cloud Seeding:

- **Static Cloud Seeding:**
 - This method involves introducing **ice nuclei**, such as **silver iodide or dry ice**, into cold clouds that have supercooled liquid water droplets.
 - The ice nuclei can trigger the formation of ice crystals or snowflakes, which can grow at the expense of the liquid droplets and fall as precipitation.
- **Dynamic Cloud Seeding:**
 - **Dynamic cloud seeding** is a technique to artificially stimulate rainfall by enhancing vertical air currents, thereby promoting the formation and growth of rain clouds.
 - The process is considered more complex than static cloud seeding because it depends on a sequence of events working properly.
- **Hygroscopic Cloud Seeding:**
 - This method involves **spraying fine particles of hygroscopic materials**, such as **salts** through **flares or explosives** into the base of warm clouds.
 - The particles can act as cloud condensation nuclei and increase the number and size of the cloud droplets, which can enhance the reflectivity and stability of the clouds.
- **Glaciogenic Cloud Seeding:**
 - It involves **inducing ice formation in supercooled clouds** by dispersing ice nuclei such as silver iodide or dry ice, leading to ice nucleation and precipitation.

➤ Applications of the Technique:

- Cloud seeding is **also used to enhance winter snowfall and increase mountain snowpack**, supplementing the natural water supply for nearby communities.
- Cloud seeding can also be done to **prevent hailstorms, dissipate fog, induce rainfall in drought-prone regions**, or reduce air pollution.



What are the Challenges in Implementation of Cloud Seeding?

- **Environmental Impact:** As artificial rain falls, seeding agents like silver iodide, dry ice or salt will also fall.
 - Residual silver discovered in places near cloud-seeding projects is considered toxic. As for dry ice, it can also be a source of **greenhouse gas** that contributes to **global warming** (carbon dioxide).
- **Temporary Relief:** While cloud seeding may provide **short-term relief from air pollution** by washing away particulate matter, it does not address the root causes of pollution such as vehicular emissions and industrial discharges.
 - **Example:** Cloud seeding in Lahore, improved AQI from “poor” to “moderate.” However, the effects were short-lived.
- **Availability Issues:** Cloud seeding **requires the presence of moisture-filled clouds**, which are not always available or predictable.
 - Specific cloud characteristics, including liquid water content and vertical motion, were used to identify clouds with potential for rainfall.

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- **Costly:** It involves processes such as delivering chemicals to the sky and releasing them into the air by flare shots or aeroplanes, which involves huge costs and logistic preparation.
 - **Example:** Cloud seeding in Delhi requires Rs 13 crore to cover the entire aerial area of 1,300 square kilometers.

Cloud seeding works if done correctly

Cloud seeding experiments were carried out in Solapur city, which gets less rainfall, from June to September in 2018 and 2019

- There was 18% increase in rainfall over a 100 sq.km area in Solapur city due to cloud seeding

- Approximate cost of producing water through cloud seeding was 18 paisa per litre. The cost can drop by over 50% if indigenous seeding aircraft are used

- 20-25% of cumulus clouds produce rainfall if cloud seeding is done correctly

- Cloud seeding alone cannot mitigate droughts but can help produce additional rainfall that can partially address water requirements

- Calcium chloride flare was used for seeding the clouds. The seeding was done at the base of the warm convective clouds and at a time when the clouds were growing

- The study was carried out for two years to understand the microphysics and characteristics of convective clouds that can be targeted to enhance rainfall

- The work provides elaborate protocols and technical guidance to plan and conduct cloud seeding in India

Not all:
As microphysics of clouds vary widely, not all clouds produce rainfall through cloud seeding



UNFCCC COP29 Baku

Why in News?

Recently, the **United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties 29 (COP29)** concluded in **Baku, Azerbaijan**. This conference saw around 200 countries negotiate agreements aimed at addressing **global climate challenges**.

What are the Key Highlights of the COP29?

- **New Climate Finance Goal:** A major breakthrough at COP29 was the **New Collective Quantified Goal on Climate Finance (NCQG)**. It aims to triple climate finance for developing countries to **USD 300 billion per year by 2035 from the previous goal of USD 100**, with developed countries taking the lead.

- It also makes a general call on all actors to scale up climate financing to USD1.3 trillion per year by 2035 from all public and private sources to help developing countries mitigate and adapt to climate impacts.

- **Carbon Markets Agreement:** COP29 reached a landmark agreement to finalise the mechanisms for **carbon markets** including **country-to-country trading (Article 6.2 of the Paris Agreement)** and a **centralised carbon market under the United Nations (UN) (Article 6.4 of the Paris Agreement)**.

- Article 6.2, allows bilateral agreements between countries to trade carbon credits based on mutually agreed terms.
- **Paris Agreement Crediting Mechanism** (also known as Article 6.4) seeks to develop a centralised, **United**

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Nations-managed carbon emissions offset and trading system.

- **Declaration on Reducing Methane:** Over 30 countries, including the US, Germany, UK, and UAE, endorsed the **COP29 Declaration on Reducing Methane from Organic Waste (India is not a signatory)**.
 - The declaration targets the **waste sector's methane emissions**, which contribute to **20% of global methane emissions**. It focuses on five priority areas: **Nationally Determined Contributions (NDCs)**, regulation, data, finance, and partnerships.
 - Countries are encouraged to **include sectoral targets for reducing methane emissions** from organic waste in their **NDCs**.
 - This builds on the **Global Methane Pledge** (India is not a signatory) to reduce **global methane emissions by 30% by 2030**, addressing methane from agriculture, waste, and **fossil fuels**.
- **Indigenous Peoples and Local Communities:** COP29 reinforced the importance of **Indigenous Peoples and local communities** in addressing climate change.
 - COP29 adopted the **Baku Workplan** and renewed the **Facilitative Working Group (FWG)** mandate under the **Local Communities and Indigenous Peoples Platform (LCIPP)**.
 - The Baku work plan prioritises bridging indigenous knowledge with modern science, enhancing **indigenous participation in climate dialogues** and embedding indigenous values into climate policies.
 - The **FWG will implement the Baku Workplan** in a gender-responsive and collaborative manner, with a review of progress scheduled for 2027.
 - FWG of the LCIPP is a **constituted body established at COP24** to further operationalize the LCIPP and facilitate its functions on knowledge, engagement, and climate policies, working with diverse bodies.
- **Gender and Climate Change:** A decision was made to extend the **Lima Work Programme on Gender (LWPG)** for another 10 years, reaffirming gender equality in

climate action and the need for a **new gender action plan to be adopted at COP30 (Belém, Brazil)**.

- Established in 2014, the LWPG aims to advance gender balance and integrate gender considerations to ensure gender-responsive climate policy and **action under the Convention and the Paris Agreement**.
- **Baku Harmoniya Climate Initiative for Farmers:** The COP29 Presidency in partnership with the **Food and Agriculture Organization (FAO)** launches the **Baku Harmoniya Climate Initiative for Farmers**.
 - It is a platform that brings together the dispersed landscape of existing climate initiatives in the field of food and agriculture, in order to make support for farmers easier to find and to facilitate access to finance.

What is India's Stance at COP 29?

- **Opposition to the Deal:** India rejected the NCQG, criticising it for its **inadequacy**. The USD 300 billion pledge was **deemed insufficient** for addressing the climate challenges faced by developing nations.
 - India, alongside other Global South countries, has been advocating for at least **USD 1.3 trillion annually** to meet the growing demands of climate change mitigation and adaptation in developing nations, with **USD 600 billion as grants or grant-equivalent resources**.
- **Article 9 of the Paris Agreement:** India emphasised that **developed countries should lead in mobilising climate finance**, in line with **Article 9 of the Paris Agreement**, which places responsibility on developed nations.
 - However, the final deal shifted the **responsibility to all actors**, including developing countries, instead of holding developed nations accountable for their **historical emissions and financial commitments**.
- **Solidarity with Vulnerable Nations:** India backed the concerns of **Least Developed Countries (LDCs)** and **Small Island Developing States (SIDS)**, who walked

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out of the negotiations, citing that their demands for a fair and adequate financial target were being ignored.

Why is COP Important for India?

- **India's Climate Commitments and Achievements:** India's first NDC was submitted in 2015, and it updated its climate goals in 2022, highlighting achievements such as reducing emissions intensity by 33–35% and meeting 40% of its energy capacity from non-fossil fuels.
- **Securing Climate Finance:** India has been a major beneficiary of funds through mechanisms like the Green Climate Fund and carbon credits markets.
 - COP discussions on the Loss and Damage Fund are crucial for India to secure financial support for addressing the **climate-induced impacts** such as floods and cyclones.
- **Global Climate Leadership:** COP provides India the opportunity to assert its leadership in **global climate action**, with initiatives like the International Solar Alliance (ISA) to drive sustainable solutions for the global climate challenge.
- **Leveraging International Influence:** India leads the Like-minded Developing Countries (LMDC) and BASIC group at COP, amplifying the voices of the **Global South** and advocating for **equitable climate action and finance**.
 - Platforms like COP provide India opportunities to promote initiatives like the Lifestyle for Environment (LiFE) and Mangrove Alliance for Climate.

How has India's Role in Global Climate Governance Evolved?

- **1970s to 2000s:** India was cautious about Western environmental calls, fearing they would hinder its economic development.
 - At the 1972 Stockholm Conference, the then Prime Minister Indira Gandhi emphasised the need to **balance environmental protection with poverty alleviation**.
 - By signing the **UNFCCC in 1992 at the Earth Summit in Rio de Janeiro**, India formally embraced

sustainable development and supported Common But Differentiated Responsibilities (CBDR), which recognised the varying capacities and responsibilities of developed and developing nations.

- India hosted **COP8 in 2002**, marking its shift from a passive participant to an active role in climate negotiations.
- India launched the National Action Plan on Climate Change (NAPCC) in 2008, demonstrating its commitment to reducing emissions and promoting renewable energy.
- **Post-2015:** The Paris Agreement, 2015 marked a pivotal shift in global climate governance, allowing **developing nations like India to contribute to climate action** without facing disproportionate obligations.
 - The transition from rigid emission reduction targets to **voluntary Nationally Determined Contributions (NDCs)** enabled India to align its climate commitments with developmental priorities.
 - India submitted its Nationally Determined Contributions (NDCs) and updated them in 2022.
 - India contributed **USD 1.28 billion to climate finance** for other developing countries in 2022, reinforcing its role as a **climate leader**.
- **Advocacy for Climate Equity and Justice:** India advocates for developed nations to provide financial and technological support to developing countries and actively supports mechanisms like the **Green Climate Fund and Loss and Damage Fund**.
- **Leading Global Initiatives:**
 - **International Solar Alliance (ISA):** Launched in 2015 by India and France at the COP21 summit in Paris, ISA aims to promote solar energy adoption globally.
 - **Lifestyle for Environment (LiFE):** Advocates sustainable consumption patterns to reduce carbon footprints.
 - **Mangrove Alliance for Climate:** Promotes the conservation of mangrove ecosystems to mitigate climate impacts.

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UNFCCC COP 29

About UNFCCC COP

UNFCCC Conference of Parties (COP)

Meets Annually (unless the Parties decide otherwise)

First COP

COP 29 (2024)

Supreme decision-making body of UNFCCC

In Bonn, the Secretariat (unless a Party offers to host the session)

Held in Berlin, Germany (1995)

Baku, Azerbaijan

Major Outcomes of COP 29

Key Goals & Agreements

USD 300 billion annual climate finance goal by 2035 under the New Collective Quantified Goal on Climate Finance (NCQG)

Agreement on govt-to-govt carbon markets (under the Paris Agreement)

Extended Lima Work Programme on Gender (2014) for 10 years

Over 30 countries endorsed → Reducing Methane from Organic Waste Declaration (India is not a signatory)

New Initiatives & Programs

01 Global Matchmaking Platform for Industrial Decarbonisation

02 Baku Adaptation Roadmap for National Adaptation Plans

03 Baku Initiative for Climate Finance, Investment, and Trade (BICFIT) Dialogue

04 Baku Harmoniya Climate Initiative for Farmers

05 Baku Initiative on Human Development for Climate Resilience

06 Climate and Health Continuity Coalition

07 Adopted → Baku Workplan & renewed the Facilitative Working Group (FWG)

Sector-Specific Declarations

Declaration on Green Digital Action

Declaration on Enhanced Action in Tourism

Baku Call on Climate Action for Peace, Relief and Recovery



Multisectoral Actions Pathways (MAP) Declaration for Resilient and Healthy Cities

Declaration on Water for Climate Action

India's Initiatives

- Advocated industrial decarbonisation & hydrogen solutions
- Endorsed disaster-resilient infrastructure through Coalition for Disaster Resilient Infrastructure
- Endorsed gender-inclusive climate action
- Supported solar energy adoption, targeting 20-fold increase by 2050
- India & Sweden co-chaired → 6th Annual Summit of the Leadership Group for Industry Transition (LeadIT)

COP 30 to be held in Belem, Brazil in November, 2025

Avian Botulism at Sambhar Lake

Why in News?

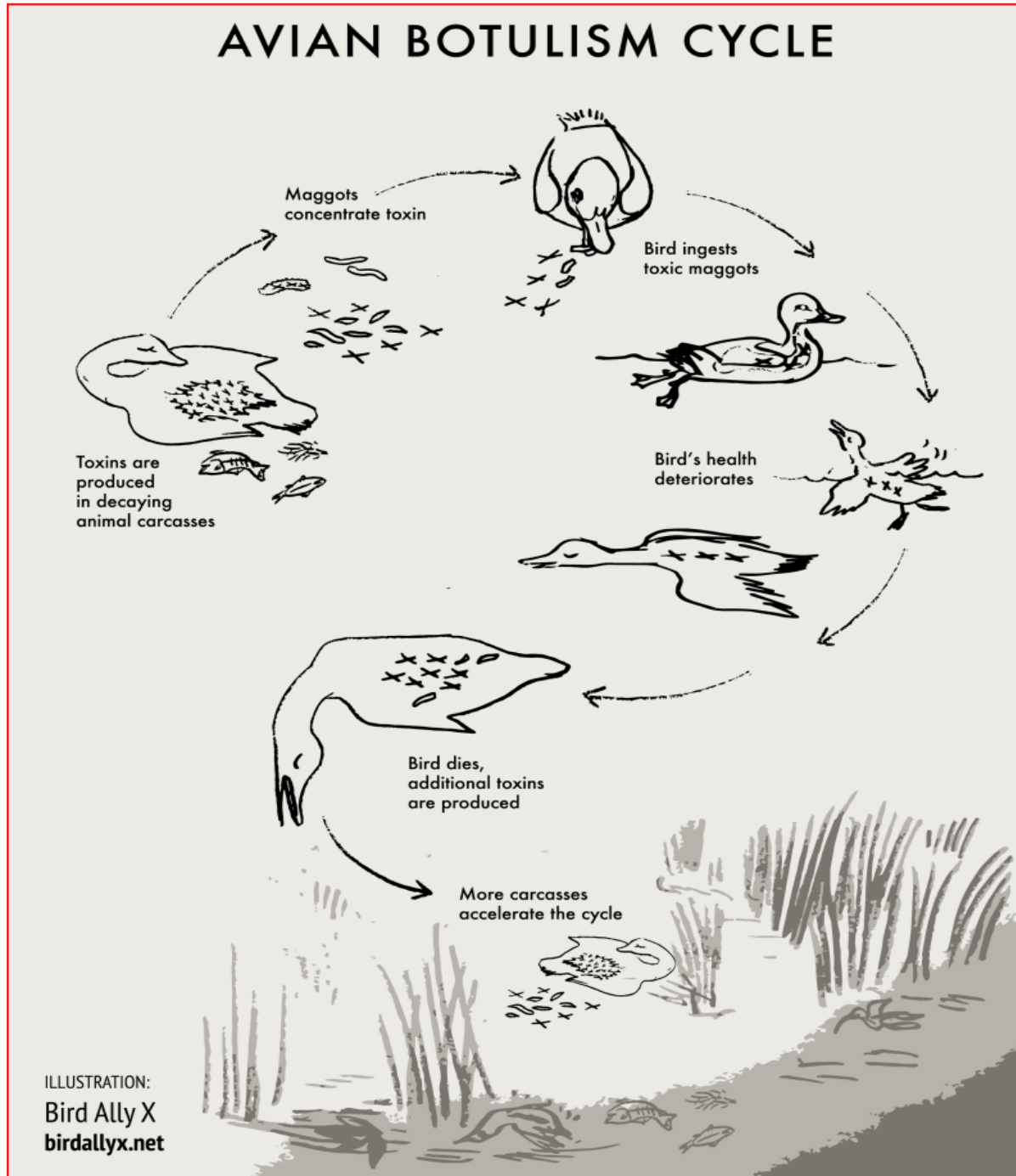
Recently, a mass death of migratory birds died at **Sambhar Lake in Rajasthan**, likely due to **avian botulism**. The outbreak is believed to be caused by high temperatures and reduced salinity in the lake.

What is Avian Botulism?

- **Definition:** Avian botulism is a **neuromuscular disease** caused by toxins produced by the bacterium ***Clostridium botulinum***. The disease affects **wild birds**, primarily waterfowl and fish-eating birds, causing paralysis and death.
- **Environmental Conditions:** Avian botulism outbreaks are triggered by specific environmental factors, including:
 - **High water temperatures.**
 - **Low oxygen levels in water.**
 - **Stagnant or sub-optimal water conditions.**
- **Transmission:** Botulism outbreaks occur when invertebrates or fish ingest the bacteria and die in poor water conditions. The **bacteria multiply in the carcasses, producing toxins** that affect waterfowl and fish-eating birds.
 - Scavengers, including other birds and mammals, can also ingest the toxin from the carcasses.
- **Symptoms in Birds:** **Muscle weakness, paralysis and difficulty flying or standing.** Affected birds may **lose the ability to hold their heads up.**
- **Disease Management:** There is no treatment for this disease. Control of avian botulism is challenging due to the **natural presence of *Clostridium botulinum*** in the environment.
 - However, removing and **properly disposing of carcasses** helps limit toxin spread. Water level management in smaller lakes can reduce outbreaks.
- **Public Health Concerns:** *Clostridium botulinum* has seven types (A-G), with types C and E affecting wild birds.

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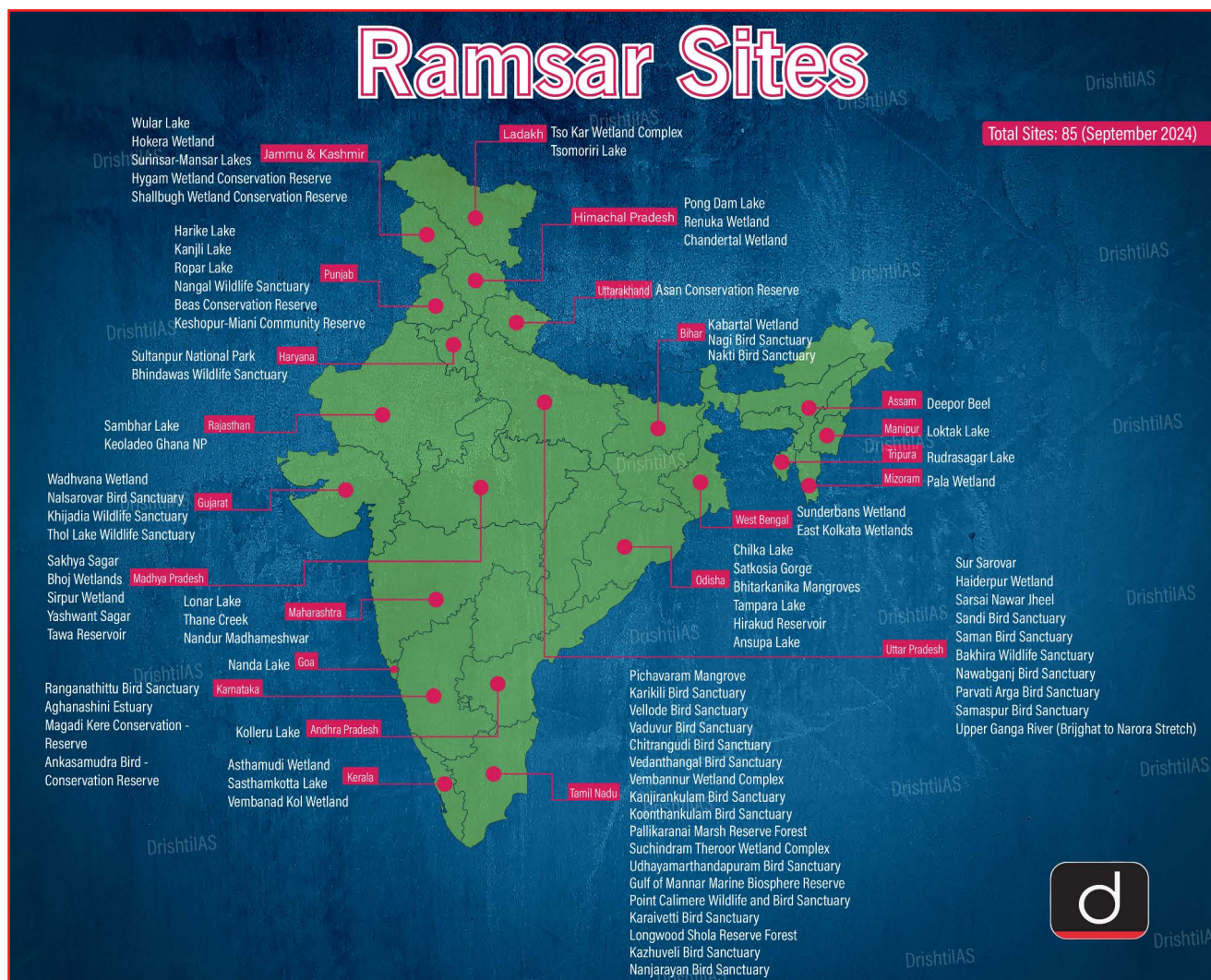
- **Botulism in humans is usually caused by type A or B toxins** from improperly canned food.
 - Type C doesn't impact humans, but type E can be contracted from infected fish, though proper cooking can inactivate the toxin.
 - Precautions, like wearing gloves and washing hands, should be taken when handling dead birds or fish to prevent contamination.
- **Factors Triggering Botulism at Sambhar Lake: High temperatures** in Jaipur (1-5.1°C above normal) in October, **reduced salinity** from freshwater inflow, and a lack of rainfall contributed to **low oxygen levels** in Sambhar Lake, creating ideal conditions for *Clostridium botulinum* growth.



Note:

Sambhar Lake

- Sambhar Lake, **India's largest saline wetland**, is located in the Nagaur and Jaipur districts of Rajasthan, bordered by the **Aravalli hills**. It is the source of most of **Rajasthan's salt production**.
 - It was designated a **Ramsar site in 1990** due to its ecological significance.
- It attracts thousands of migratory birds, including **flamingos**, from November to February. During the monsoon, the lake comes alive with birds like coots, **black-winged stilts**, **sandpipers**, and **redshanks**.



Carbon Credits

Why in News?

A recent study in *Nature journal* reveals that **only 16%** of carbon credits result in **actual emissions reductions**, casting doubt on the effectiveness of carbon markets.

- As the 29th **Conference of the Parties to the United Nations Framework Convention on Climate Change (COP29)** prioritizes new carbon trading mechanisms, this study raises critical concerns about the reliability of emissions reduction claims.

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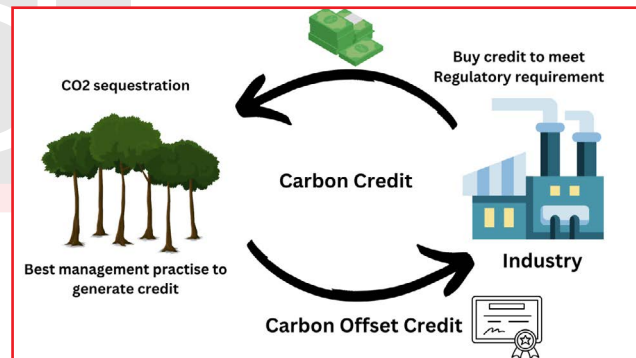
What are the Key Highlights of the Study?

- **Ineffectiveness of Carbon Credits:** The study analyzed projects generating **carbon credits** equivalent to one billion tonnes of Carbon dioxide(CO₂) under **Kyoto Protocol, 1997** mechanisms, and revealed that **only 16% of these credits corresponded to actual emissions reductions.**
- **HFC-23 Abatement Success:** The most effective emissions reductions were observed in projects focused on the elimination of **Hydrofluorocarbon (HFC)-23, a potent greenhouse gas.**
 - Around 68% of credits from these projects resulted in actual emissions cuts, making them the most successful among the projects reviewed.
- **Challenges with Other Projects:** Avoided deforestation projects only resulted in a 25% effectiveness rate.
 - An “avoided deforestation project” is a conservation effort that **protects forests from being cleared**, preventing the release of CO₂ that would occur if the trees were cut down.
 - **Solar cooker deployment projects** showed even lower effectiveness, with just 11% of credits leading to emissions reductions.
- **Flaws in Assessing Additionality:** The study found that many projects under the **Kyoto Protocol** failed the “**additionality**” rule, meaning emissions reductions could have occurred without the revenue from carbon credits.
 - **Additionality** requires projects to **reduce emissions beyond what would have happened in a business-as-usual scenario.**
 - The study highlighted flaws in current assessments, with many Kyoto mechanisms issuing credits for non-additional reductions, undermining emission claims.
 - These issues emphasise the need for more robust carbon trade mechanisms under the **Paris Agreement, 2015** with progress expected at COP29 in Baku.
- **Recommendations:** The study calls for **stricter eligibility criteria and improved standards and methodologies** to quantify emission reductions.
 - Projects with a **high likelihood of additionality** should be prioritised.

- The study stresses the need for **robust carbon trading mechanisms** under the **Paris Agreement**, with safeguards to ensure credits reflect real emissions reductions.

What are Carbon Credits?

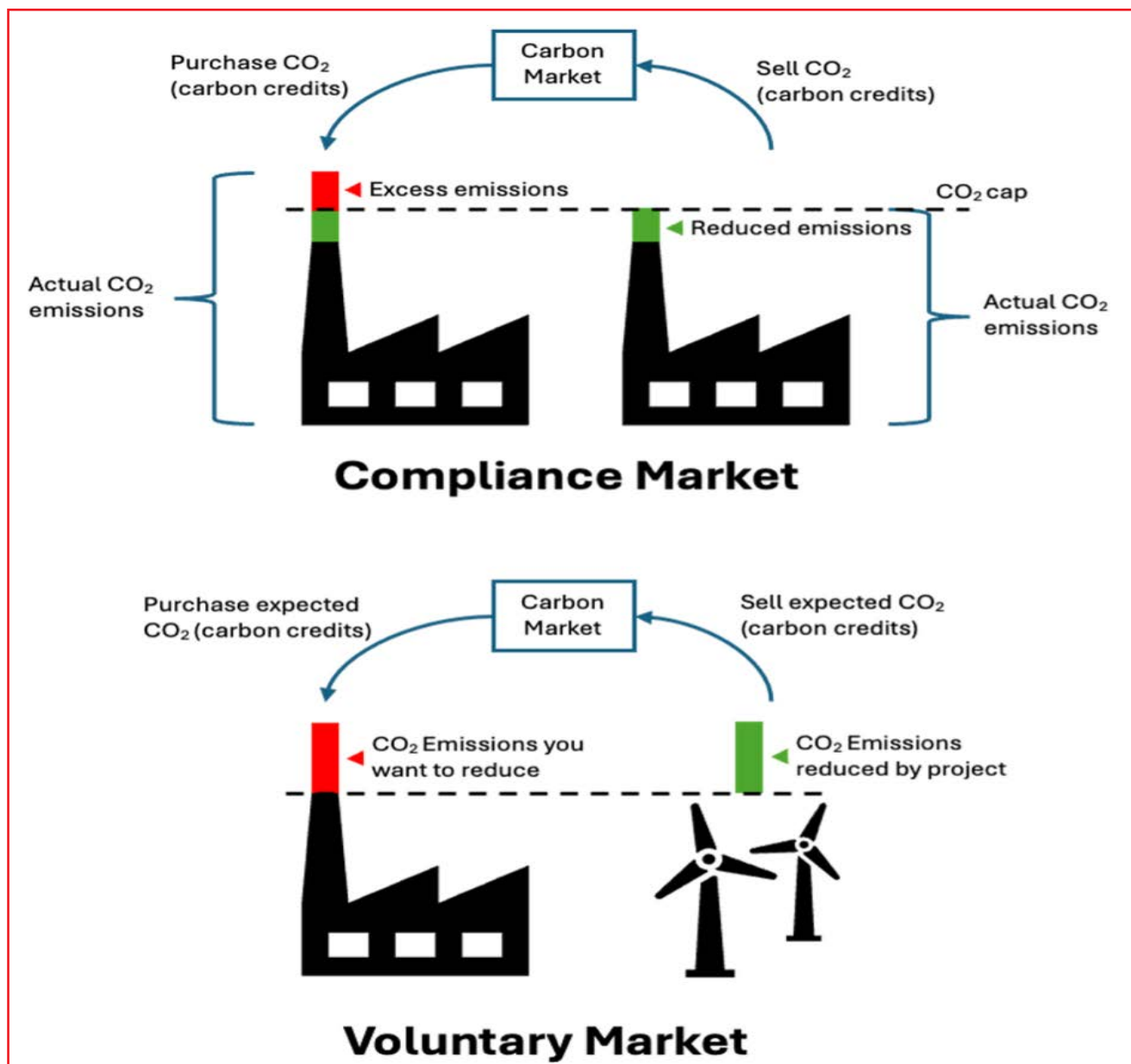
- **About:** Carbon credits, or carbon offsets, refer to **carbon emissions reductions or removals**, measured in **tonnes of carbon dioxide equivalent (tCO₂e).**
 - The concept of carbon credit, introduced in the **Kyoto Protocol, 1997** and reinforced by the **Paris Agreement, 2015** aims to reduce **greenhouse gases (GHG)** emissions through **carbon trading.**
 - Each carbon credit permits the emission of **one tonne of CO₂** or its equivalent.
 - These credits are generated by projects that **absorb or reduce carbon emissions** and are certified by international bodies like the **Verified Carbon Standard (VCS)** and the **Gold Standard.**



- **Carbon Markets:** The carbon markets established under the **Paris Agreement** aim to **create more robust, reliable systems** for trading carbon credits and ensuring transparency in emissions reductions.
 - Under **Article 6 of the Paris Agreement**, countries can work together, **transferring carbon credits** from emission-reducing projects to help other countries meet their climate goals.
- **Types of Carbon Markets:**
 - **Compliance Markets:** Established through **national or regional emissions trading schemes (ETS)**, where participants are legally obligated to meet specific emission reduction targets.
 - These markets are driven by regulatory frameworks and impose penalties for non-compliance.

Note:

- Participants include governments, industries, and businesses, all of whom must meet emissions limits set by the authorities.
- **Voluntary Markets:** In voluntary carbon markets, there is no formal obligation to reduce emissions.
 - Participants, such as companies, cities, or regions, voluntarily engage in carbon trading to offset their emissions and meet sustainability goals, such as achieving climate neutrality or net-zero emissions.
 - This is often done as **part of corporate social responsibility (CSR)** initiatives or to gain a market advantage by showcasing environmental responsibility.



- **Benefits of Carbon Credits:** Projects that aim at forest protection or sustainable land management can preserve **critical habitats**, animal and plant species, and promote ecosystem services. Carbon credits can also play a role in **financing sustainable projects**.

Note:

THE CORE CARBON PRINCIPLES

A. GOVERNANCE

Effective governance

The carbon-crediting program shall have effective program governance to ensure transparency, accountability, continuous improvement and the overall quality of carbon credits.

Tracking

The carbon-crediting program shall operate or make use of a registry to uniquely identify, record and track mitigation activities and carbon credits issued to ensure credits can be identified securely and unambiguously.

Transparency

The carbon-crediting program shall provide comprehensive and transparent information on all credited mitigation activities. The information shall be publicly available in electronic format and shall be accessible to non-specialised audiences, to enable scrutiny of mitigation activities.

Robust independent third-party validation and verification

The carbon-crediting program shall have program-level requirements for robust independent third-party validation and verification of mitigation activities.

B. EMISSIONS IMPACT

Additionality

The greenhouse gas (GHG) emission reductions or removals from the mitigation activity shall be additional, i.e., they would not have occurred in the absence of the incentive created by carbon credit revenues.

Permanence

The GHG emission reductions or removals from the mitigation activity shall be permanent or, where there is a risk of reversal, there shall be measures in place to address those risks and compensate reversals.

Robust quantification of emission reductions and removals

The GHG emission reductions or removals from the mitigation activity shall be robustly quantified, based on conservative approaches, completeness and sound scientific methods.

No double counting

The GHG emission reductions or removals from the mitigation activity shall not be double counted, i.e., they shall only be counted once towards achieving mitigation targets or goals. Double counting covers double issuance, double claiming, and double use.

C. SUSTAINABLE DEVELOPMENT

Sustainable development benefits and safeguards

The carbon-crediting program shall have clear guidance, tools and compliance procedures to ensure mitigation activities conform with or go beyond widely established industry best practices on social and environmental safeguards while delivering positive sustainable development impacts.

Contribution to net zero transition

The mitigation activity shall avoid locking-in levels of GHG emissions, technologies or carbon-intensive practices that are incompatible with the objective of achieving net zero GHG emissions by mid-century.

What are the Concerns Regarding Carbon Credits?

- **Non-Adherence to Additionality:** Carbon credits should only be given for projects that achieve **emissions reductions beyond what would have happened naturally**. This concept is known as **additionality**, a core principle of Carbon Credits.
 - Due to lack of clear additionality rules, credits are given to projects that would have reduced the same amount of emissions anyway, making the **carbon market less effective**.
- **Greenwashing:** Some companies claim carbon credits as a way to appear environmentally responsible without making substantial changes to their operations, a practice known as **greenwashing**.
 - This undermines the **credibility of the carbon credit market** and can mislead consumers and investors about the actual environmental impact.
- **Market Transparency:** Lack of transparency in how carbon credits are generated and traded can raise doubts about the **legitimacy of the market**.
 - Lack of real-time tracking and independent audits weakens the system's integrity, leading to issues like **double-counting emissions reductions**.
- **Inequitable Access:** Developing countries may face barriers in accessing resources or **technology to**

participate in carbon credit generation, limiting their ability to benefit from the market. This can perpetuate inequalities in the global climate effort.

➤ Key Challenges Facing India's Carbon Credit Market:

- **Industry Readiness & Compliance Costs:** The high cost of monitoring and verification systems limits smaller projects in India, especially **Micro, Small and Medium Enterprises (MSMEs)**, which generate around **110 million tonnes** of CO₂ annually, hindering their participation in the carbon market.
- **Regulatory and Oversight Mechanisms:** **India's carbon market**, while **still in its early stages**, requires strong enforcement and an alignment with both domestic and international standards to be effective.

India's Initiatives Related to Carbon Credit

- **Nationally Determined Contributions (NDCs):** India updated its **NDCs** in 2023 to include the establishment of a **domestic carbon market**.
- **Energy Conservation (Amendment) Act, 2022:** Provides the legal framework for the **Carbon Credit Trading Scheme (CCTS)**. It empowers the Indian government to establish a **domestic carbon market** and to authorise designated agencies to issue **carbon credit certificates (CCCs)**.

Note:



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- The CCTS is a unified **Indian Carbon Market (ICM)** established to reduce GHG emissions through the trading of carbon credit certificates.

- **Perform, Achieve and Trade (PAT) scheme**
- **Renewable Energy Certificates (REC)**
- **Green Credit Programme.**
- **Monitoring and Verification:** The **Bureau of Energy Efficiency (BEE)** and the **National Steering Committee for Indian Carbon Market (NSCICM)** are responsible for ensuring the integrity of the carbon credits through rigorous monitoring, reporting, and verification processes.

Tackling Air Pollution

Why in News?

The **Indo-Gangetic Plain**, encompassing Delhi, Bihar, Chandigarh, Haryana, Punjab, Uttar Pradesh, and West Bengal, has recently been severely affected by **intense air pollution**.

- For instance, in Delhi, the **Air Quality Index (AQI)** rose to **approximately 500**, highlighting the **severe air pollution** challenge in the IGP, which is home to **9% of the global population and 40% of India's population**.

What is the Status of Air Pollution in India?

- **Leads in Worst-Polluted Cities:** India has the highest number of cities in the **top 100** most polluted cities globally, with **39 cities** ranked among them, surpassing **China**, which has **30 cities** in the list.
- **Regional Comparison:** Other South Asian countries contribute significantly to global pollution, with **Pakistan having 7 cities, Bangladesh 5, and Nepal 2** cities in the top 100.
 - **53** of the top 100 polluted cities are in the **Indian subcontinent**.
- **Life Expectancy Reduction:** According to a **2019 study** by the **Energy Policy Institute at the University of Chicago (EPIC)**, residents of IGP have an average **life expectancy shorter by seven years** compared to other parts of the country due to severe air pollution.

THE UNWANTED CROWN

Country	Number of cities in top 100 most polluted
India	39
China	30
Pakistan	7
Bangladesh	5
Iran	3
South Africa	3
Nepal	2
Indonesia	2

The list includes top 6 countries, hence the total is not 100

Source: S&P Global Mobility

Top ten most polluted countries (2023)

Rank	Country	Average PM 2.5 ug/m3
1	Bangladesh	79.9
2	Pakistan	73.7
3	India	54.4
4	Tajikistan	49.0
5	Burkina Faso	46.6
6	Iraq	43.8
7	UAE	43.0
8	Nepal	42.4
8	Egypt	42.4
9	Congo	40.8

Source: IQAir

Note:

What is AQI?

- **About:** AQI is a **numerical scale** used to measure and communicate the quality of air based on the concentration of **major pollutants**.
 - It was established by the **Environmental Protection Agency (EPA)**.
- **Categories:** There are six AQI categories:
 - Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe.
- **Pollutants Covered:** AQI considers **eight** pollutants namely **PM 10, PM 2.5, Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂), Carbon Monoxide (CO), Ozone (O₃), Ammonia (NH₃), and Lead (Pb)**.
- **Scale of AQI:** The AQI ranges from **0 to 500**, with higher values indicating **worse air quality** and greater health risks.

AQI Category	AQI	Concentration Range*							
		PM ₁₀	PM _{2.5}	NO ₂	O ₃	CO	SO ₂	NH ₃	Pb
Good	0-50	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory	51 - 100	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0
Moderately Polluted	101-200	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0
Poor	201-300	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very Poor	301-400	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe	401-500	430+	250+	400+	748+*	34+	1600+	1800+	3.5+

* CO in mg/m³ and other pollutants in µg/m³; 24-hourly average values for PM₁₀, PM_{2.5}, NO₂, SO₂, NH₃, and Pb, and 8-hourly values for CO and O₃.

- **Effects of Bad Air Quality:**
 - **Short-Term Effects:** Symptoms such as **headaches, nasal congestion, and skin irritation** are common when exposed to poor air quality.
 - Conditions like **asthma, allergic rhinitis, and pneumonia** may be triggered or worsened by high levels of pollutants.
 - **Long-Term Health Risks:**
 - **Chronic Respiratory Diseases:** Asthma, chronic obstructive pulmonary disease (COPD), and even lung cancer.
 - **Cardiovascular Health:** Like heart attacks, strokes, heart failure, and hypertension.
 - **Cognitive Decline:** Cognitive decline, dementia, and strokes, particularly in older adults.
 - **Skin:** Eczema and dermatitis.
 - **Internal Organ Damage:** Damage to internal organs, including the kidneys and liver.
 - **Impact on Vulnerable Groups:**
 - **Pregnant Women:** Disrupt placental development, harm foetal growth, and cause long-term health issues in children.
 - **Children:** Hinder neurological development, affecting cognitive and physical growth.

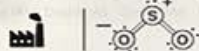
Note:



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Air Pollutants

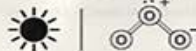
Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)



Secondary pollutant formed from other pollutants (NO_x and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

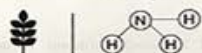
Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



Note:

What are the Causes of Air Pollution?

- **Temperature Inversions:** It occurs in **November and December** when cold air mixes with **pollutants**, trapping them near the ground. This exacerbates air pollution by preventing the dispersion of harmful particles.
- **Traffic Congestion:** Traffic congestion is a key contributor to air pollution, with Mumbai having the highest vehicle density per kilometre, followed by Kolkata, Pune, and Delhi.
 - In densely populated urban areas, **heavy traffic not only exacerbates air pollution** but also hinders efforts to improve air quality through cleaner technologies and more efficient urban planning.
 - **For example, in cities like Delhi**, despite the introduction of electric buses and stricter emission norms, traffic congestion continues to undermine air quality improvements.
- **Stubble Burning and Desert Dust:** The widespread burning of **crop residues** releases smoke, carbon dioxide, and particulate matter, significantly worsening air quality.
 - Additionally, winds from the **Thar Desert** bring **fine dust particles** into the region, further intensifying air pollution.
- **Fireworks:** The burning of fireworks releases **toxic chemicals**, **heavy metals**, and fine particulate matter into the air, which contribute to **short-term surges** in air pollution and deteriorating air quality.
- **Biomass Burning:** In rural areas, the reliance on traditional methods of cooking and heating, such as using **firewood, biomass fuels, or coal**, contributes to both indoor and outdoor air pollution.

What are the Initiatives Related to Controlling Air Pollution in India?

- **National Clean Air Programme**
- **System of Air Quality and Weather Forecasting and Research (SAFAR) Portal**
- **New Commission for Air Quality Management**
- **Graded Response Action Plan (for Delhi)**
- **For Reducing Vehicular Pollution:**
 - **BS-VI Vehicles**
 - **National Electric Mobility Mission Plan**

WHO's 4 Pillar Strategy

- WHO adopted a resolution in **2015** to address the **adverse health effects** of air pollution adopting a **4 Pillar Strategy**.
- **Those four pillars are:**
 - Expanding the knowledge base
 - Monitoring and reporting
 - Global leadership and coordination
 - Institutional capacity strengthening

Guru Ghasidas-Tamor Pingla Tiger Reserve

Why in News?

India has recently notified the **Guru Ghasidas-Tamor Pingla (GGTP) Tiger Reserve in Chhattisgarh** as the country's **56th tiger reserve**. This marks a significant step in the **nation's tiger conservation efforts**.

Note: Chhattisgarh previously had three tiger reserves: **Indravati** located in the Bijapur district, **Udanti-Sitanadi** in Gariaband, and **Achanakmar** in Mungeli.

What are the Key Facts About Guru Ghasidas-Tamor Pingla Tiger Reserve?

- **Location and Size:** The GGTP Tiger Reserve is nestled in the **Chota Nagpur plateau** and partly in the **Baghelkhand plateau**.
 - The GGTP Tiger Reserve has a **core habitat** of 2,049.2 sq. km (comprising Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuary) and a **buffer zone** of 780.15 sq. km.
 - It is the **third-largest tiger reserve in India** followed by **Nagarjunasagar-Srisailem** (Andhra Pradesh) and **Manas** (Assam).
- **Biodiversity:** A total of 753 species, including 365 invertebrates and 388 vertebrates, have been documented by the **Zoological Survey of India**, showcasing the reserve's rich biodiversity.
- **Landscape Approach:** GGTP Tiger Reserve adopts the **landscape approach**, emphasising **interconnected habitats for biodiversity conservation**. It ensures ecological connectivity with neighbouring tiger reserves like **Sanjay Dubri** (Madhya Pradesh), **Bandhavgarh** (Madhya Pradesh), and **Palamau** (Jharkhand).

Note:



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- This aligns with **India's National Wildlife Plan (2017-2031)**, promoting habitat preservation and sustainable conservation.

TIGER

Royal Bengal Tiger (*Panthera Tigris*) is the National animal of India.

Subspecies of Tiger

- * The continental (*Panthera tigris tigris*)
- * The Sunda (*Panthera tigris sondaica*)

Habitat

Tropical rainforests, evergreen forests, temperate forests, mangrove swamps, grasslands, and savannas



Countries Where Tiger Population Is Found

- ▣ Found only in **13 Tiger Range countries**- India, Nepal, Bhutan, Bangladesh, Myanmar, Russia, China, Thailand, Malaysia, Indonesia, Cambodia, Laos, and Vietnam
- ◆ As per the latest report by IUCN, tiger has gone extinct in Cambodia, Laos, and Vietnam

Protection Status

- ▣ **IUCN Red List**: Endangered
- ▣ **CITES**: Appendix I
- ▣ **WPA 1972**: Schedule I

Threats

- ▣ Habitat loss
- ▣ Poaching and illegal trade
- ▣ Human-Wildlife conflict

Conservation Efforts

- ▣ **International Big Cats Alliance (IBCA)**: For conservation of seven big cats namely Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma (launched by India)
- ▣ **Tx2 campaign**: Launched by WWF; stands for 'Tiger times 2' signaling the goal to double the tiger population by 2022
- ▣ **National Tiger Conservation authority (NTCA)**: Constituted under the WPA, 1972
- ▣ **Project Tiger**: Launched in 1973
- ▣ **Tiger Census**: Every 4 years

Tigers In India

- ▣ India has the **largest** population
 - ◆ As of 2022, India has 3167 tigers
 - ◆ Largest population has been found in Central Indian Highlands & Eastern Ghats Landscape
- ▣ **Tiger Reserves**: India now has 53 tiger reserves
 - ◆ **Ranipur in UP** is the latest
 - ◆ **Nagarjun Sagar (Andhra Pradesh)** is the **largest** while **Orang (Assam)** is the **smallest** (Core area)



Notification of Tiger Reserves

- Tiger Reserves in India are notified by **State Governments under the Wildlife (Protection) Act, 1972**, which was later amended by the **Wildlife (Protection) Amendment Act, 2022**. This process is carried out on the advice of the **National Tiger Conservation Authority (NTCA)**.

Note:

Tiger Reserves

56 Tiger Reserves



Recently Notified Tiger Reserves

- Guru Ghasidas- Tamor Pingla Tiger Reserve - Chhattisgarh
- Dholpur – Karauli Tiger Reserve – Rajasthan
- Veerangana Durgavati Tiger Reserve – Madhya Pradesh

FACTS

- A State Government, on the recommendation of the National Tiger Conservation Authority, notify an area as a tiger reserve.
- Largest Tiger Reserve (Core Area): Nagarjunsagar Srisaileam (Andhra Pradesh).
- Smallest Tiger Reserve (Core Area): Orang (Assam).
- Reserve with Highest Tiger Density: Corbett (Uttarakhand) (All India Tiger Estimation 2018).
- State with Maximum Tigers: Madhya Pradesh (All India Tiger Estimation 2018).



Note:



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History

Highlights

- World War II and India
- Raja Raja I and Chola Administration
- Megalithic Footprints and Human Figure
- Children's Day and Pt. Jawaharlal Nehru

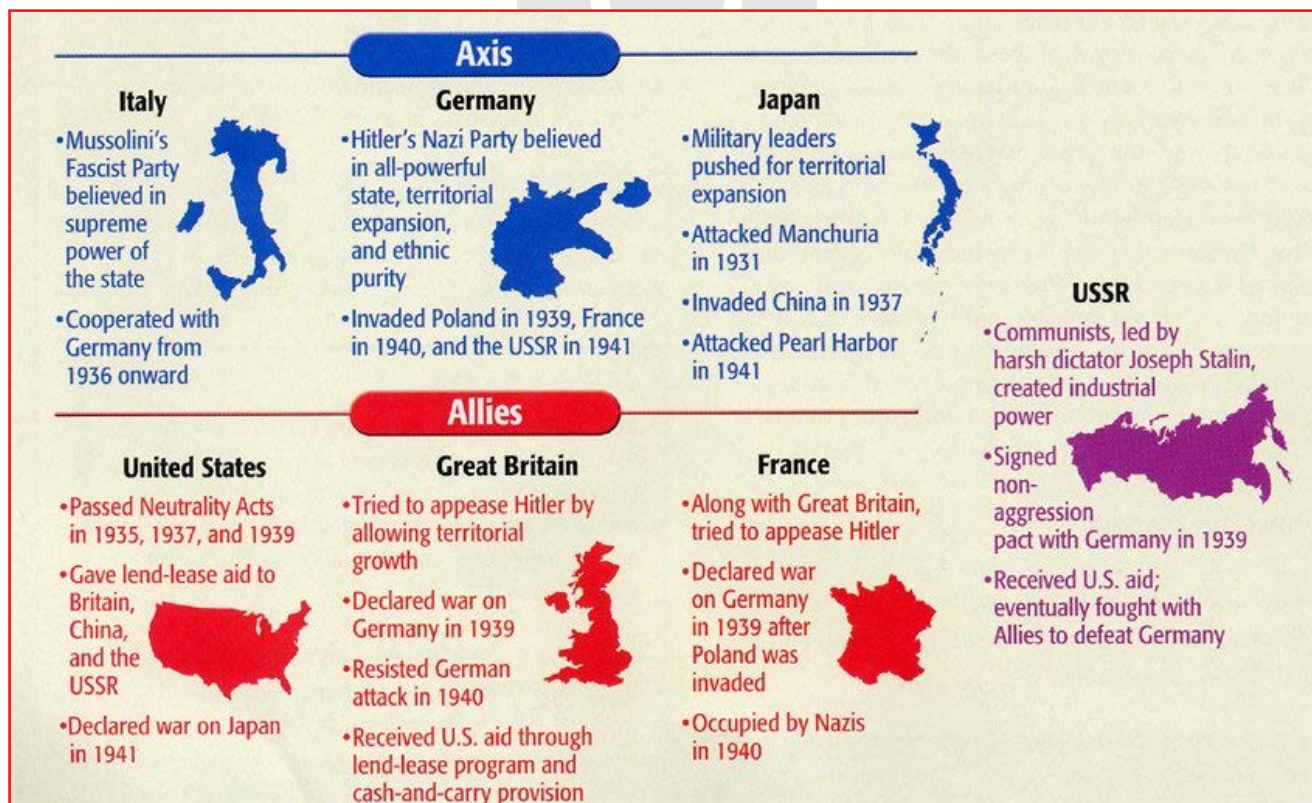
World War II and India

Why in News?

The recent discovery of 23 Japanese soldiers' remains in Bangladesh after more than 80 years has reignited discussions on **World War II** and the role of various countries, including India, in the conflict.

What are the Key Facts About World War II?

- **Duration and Scope:** World War II lasted from **1939 to 1945** and was the most widespread and devastating conflict in human history.
- **Primary Combatants:** The two main opposing alliances were the **Axis powers** (Germany, Italy, Japan) and the **Allied powers** (including the US, France, Great Britain, the Soviet Union, and, to a lesser extent, China).



- **Trigger Event:** The immediate cause of the war was **Germany's invasion of Poland** on 1st September 1939, leading Britain and France to declare war on Germany.

Note:

➤ Causes of the War:

- **Treaty of Versailles (1919):** The **Treaty of Versailles**, signed in 1919 by Germany and the Allied Nations, formally ended **World War I**.
 - The treaty required Germany to pay reparations, disarm, lose territory, and relinquish its overseas colonies. These harsh terms created resentment and **economic instability, contributing to the rise of Adolf Hitler and Nazi Germany**.
- **Failure of the League of Nations:** The **League of Nations**, established in 1919 to maintain world peace, aimed for universal membership and the resolution of disputes through negotiation rather than force.
 - Despite being a good idea, the League of Nations ultimately failed because **not all countries joined**. Its inability to stop **Japan's invasion of Manchuria in China** and Italy's invasion of Ethiopia encouraged the **Axis powers** to pursue further aggressive actions.
- **Economic Depression 1929:** The global economic downturn of the late 1920s and early 1930s led to the rise of **totalitarian regimes** (one political party that has absolute power) in countries like Italy, Japan, and Germany.
 - Germany, Italy, and Japan aggressively expanded their territories in the 1930s, leading to military confrontations.
- **Rise of Fascism:** After World War I, the victors aimed to **"make the world safe for democracy,"** leading to democratic constitutions in Germany and other states.
 - However, in the 1920s, **nationalism and militaristic totalitarianism (fascism)** emerged. It promised to meet people's needs more effectively than democracy and positioned itself as a defense against communism.
 - Benito Mussolini established the first fascist dictatorship in Europe in Italy in 1922.
- **Rise of Nazism:** Adolf Hitler, leader of the German National Socialist (Nazi) party, preached a racist form of fascism, promising to **overturn the Versailles Treaty** and secure more **Lebensraum ("living space")** for the "superior" German race.

- He became German Chancellor in 1933 and **established himself as a dictator**. In 1941, the Nazi regime launched a **war of extermination against Slavs, Jews, and others deemed inferior**.

- **Policy of Appeasement:** The policy of appeasement, followed by **Britain and France**, aimed to avoid war with aggressive powers like Japan, Italy, and Germany by **conceding to their demands to maintain peace**.
 - This approach allowed **Nazi Germany to annex territories without military intervention**, escalating the conflict.

➤ Major Phases of the War:

- **Outbreak and Early Axis Victories:** The **Phoney War (1939–1940)**, Hitler conquered Poland, leading to a period of minimal land activity as countries waited for the other to act.
 - Early Axis successes through Germany's **Blitzkrieg** (combination of speed, surprise, and concentrated firepower) tactics led to the rapid occupation of much of Western Europe, including France.
- **Operation Barbarossa (1941):** Germany invades the Soviet Union (Operation Barbarossa) marked a significant turning point.
 - Despite initial successes, the Soviet Union managed to halt the German advance, particularly during the **Battle of Stalingrad (1942–1943)**.
- **Entry of the United States:** Following **Japan's attack on Pearl Harbor** in 1941, the US entered the war, significantly altering the balance of power.
- **Turning Points:** Key battles such as the **Battle of Midway (1942)** (US defeated Japan), **El Alamein (1942)**, **Stalingrad**, and the Allied invasion of Normandy (D-Day) in 1944 reversed the Axis advances and began the push towards their eventual defeat.

➤ End of the War:

- **Defeat of Germany:** The war in Europe ended with the unconditional surrender of Nazi Germany in May 1945, following the fall of Berlin and Hitler's suicide.
- **Defeat of Japan:** Japan surrendered in August 1945, after the US dropped atomic bombs on the cities of **Hiroshima (August 6)** and **Nagasaki (August 9)**. With Japan's surrender, World War II finally came to an end.

Note:



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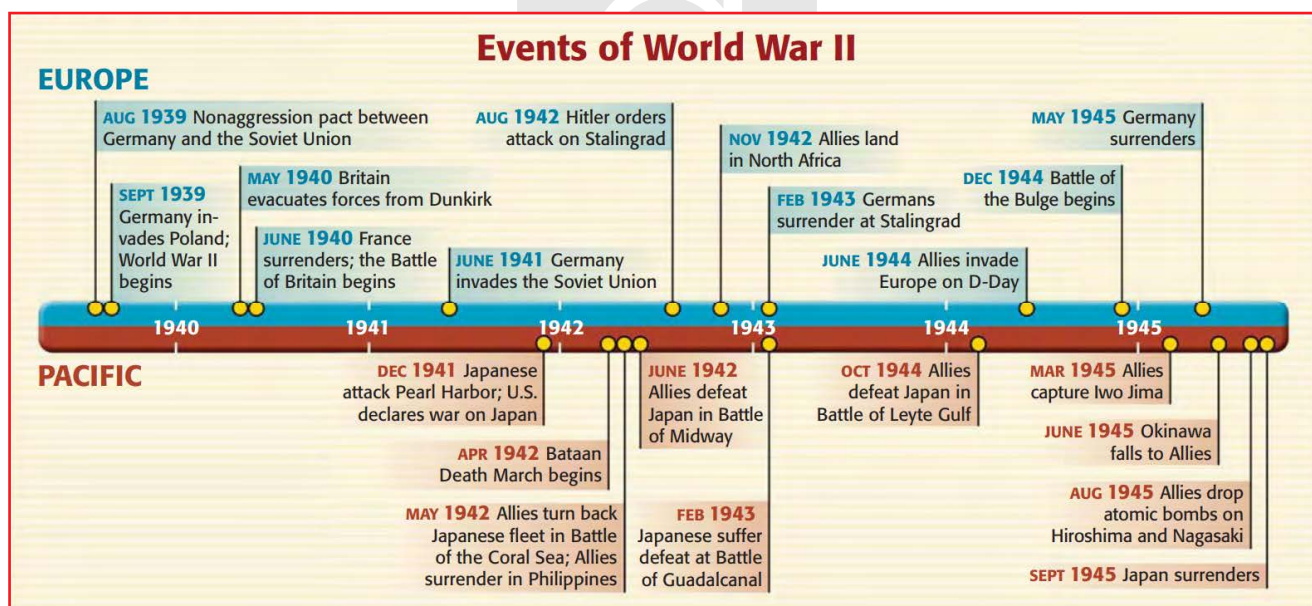
What are the Consequences of World War II?

➤ Consequences:

- **Human Cost:** The war led to an estimated **70-85 million** deaths, both military and civilian, including the **Holocaust**, where **six million Jews** were killed by Nazi Germany.
- **Emergence of the Cold War:** The Axis powers were defeated, leading to the **fall of Nazi Germany** and **Imperial Japan** and the division of **Germany** into occupation zones.
 - The **Soviet Union** expanded its influence in Eastern Europe, while the **US** emerged as a superpower, marking the beginning of the **Cold War**.
- **United Nations:** The **UN was established in 1945** to promote international cooperation and prevent future conflicts.
- **Economic Recovery:** The US implemented the

Marshall Plan (1948) to aid in the reconstruction of war-torn western Europe.

- **Nuclear Arms Race:** The atomic bombings of Hiroshima and Nagasaki marked the beginning of the **nuclear age**, leading to the **nuclear arms race** during the Cold War.
 - **Decolonization:** Many European colonial empires weakened after the war, leading to a wave of **anti-colonial movements across Africa, Asia, and the Middle East**.
- **Legacy of World War II:**
- **Rise of the Cold War:** The ideological and political rivalry between the US and the Soviet Union led to the Cold War, which lasted for several decades.
 - **Global Realignments:** The war significantly reshaped international relations, leading to the formation of **new alliances and influencing the political, economic, and social landscapes** of the world in the decades that followed.



What was India's Role in World War II?

- **Part of the British Empire:** At the time of World War II, India, along with Pakistan and Bangladesh, was a colony under British rule.
- **Unilateral Declaration of War:** The British government, led by **Viceroy Lord Linlithgow**, declared India's involvement in the war without consulting Indian political leaders, sparking discontent.
- **Massive Contribution of Soldiers:** India sent over 2.5 million soldiers to fight in various theatres of war under British command, making it the largest volunteer army in the world.
- **Support for the Allied Nations:** Indian troops fought on all major fronts, including Europe, Africa, the Middle

Note:

East, and Southeast Asia. They played a crucial role in liberating Italy and providing critical supplies to the war effort.

- Their participation in the **Battle of Monte Cassino in Italy** was pivotal.

➤ **India with Axis Powers:** During World War II, Subhas Chandra Bose led the **Indian National Army (INA)** with support from Japan.

- The INA fought alongside Japanese forces against the British in Southeast Asia, including regions like Myanmar and Thailand, aiming to secure India's independence from British rule.

How did Indians View World War II?

➤ **Opposition to British Rule:** The **Indian National Congress (INC)** provincial governments resigned in 1939 in protest against the unilateral decision of the Governor General of India Lord Linlithgow to involve India in the Second World War.

- They demanded that India's political future should be decided by its own people after the war.

➤ **Support for Independence:** Many Indians, particularly under leaders like **Mahatma Gandhi**, saw the war as an opportunity to demand independence from Britain.

- They believed Britain's weakened position during the war could be leveraged to achieve freedom.

➤ **Conditional Support:** Some factions, including the **Muslim League** and the **Hindu Mahasabha**, supported the British war effort, hoping that India's contribution would result in leniency and eventual independence.

What was the Impact of World War II on India?

➤ **Increased Nationalism:** The war and the British response fueled a new wave of nationalism, particularly after the creation of the **Indian National Army (INA)** by Subhas Chandra Bose, which fought alongside the Japanese in Southeast Asia.

➤ **Economic Strain:** The war had a devastating impact on India's economy, causing **inflation**, high taxes, corruption, and famines.

- The **Bengal famine of 1943**, one of the most catastrophic, led to millions of deaths.

➤ **Post-War Independence Movement:** The impact of the war made it increasingly difficult for Britain to maintain its empire. By the end of the war, the demand for Indian independence was undeniable.

- Additionally, many Indians who returned from the war realized they had **fewer civil liberties compared to Europeans**, further fueling the demand for independence and paving the way for India's independence in 1947.

Raja Raja I and Chola Administration

Why in News?

Recently, the birth anniversary of Chola emperor **Raja Raja Chola I** was celebrated during the **Sadhya Vizha festival** (mid-October to mid-November) in Thanjavur, Tamil Nadu.

- He was born as **Arulmozhi Varman** in 947 CE and adopted the title "**Rajaraja**," meaning "**King among Kings**".

What are Key Facts About Rajaraja Chola I?

➤ **About:** Rajaraja Chola I was the third child of **Parantaka Chola II** and **Vanavan Mahadevi**.

- The **Thiruvallangadu inscription** credits **Uttama Chola (predecessor)** with appointing **Arunmozhi (Rajaraja I) as his successor**, recognising his extraordinary potential.

- He ruled from **985 to 1014 CE** and was marked by **military prowess** and profound **administrative vision**.

➤ **Notable Military Conquests:**

- **Battle of Kandalur Salai (988 CE):** It was a naval battle against the **Cheras (central and northern Kerala)** at Kandalur in Kerala.

- It was the first military achievement of **King Rajaraja I** and resulted in the destruction of **Chera naval forces and ports**.

- **Conquest of Kerala and the Pandyas:** According to the **Senur inscription (Tamil Nadu)**, Rajaraja Chola I destroyed the **Pandya capital Madurai**, and conquered Kollam.

- After victory, he took the title "**Pandya Kulashani**" (**thunderbolt to the Pandyas**) and renamed the region "**Rajaraja Mandalam**."

- He also adopted the title "**Mummudi Chola**" (**Chola who wears the three crowns**) to signify

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his dominance over the **Cholas**, **Pandys**, and **Cheras**.

- **Victory in Sri Lanka (993 CE):** Rajaraja Chola I **invaded Sri Lanka in 993 CE** and the northern half of Sri Lanka was captured and established **Jananathamangalam** as the provincial capital.
 - The conquest was completed under his son **Rajendra Chola I in 1017**.
- **Conflict with the Chalukyas:** He defeated the **Chalukyas** in Karnataka, annexing regions like **Gangavadi and Nolambapadi**.
 - He fostered alliances through strategic marriages, such as his daughter **Kundavai's union with Vimaladitya of Vengi**.
- **Chola Navy:** Rajaraja Chola I strengthened the navy, earning the Bay of Bengal the title "**Chola Lake**."
- **Nagapattinam (TN)** served as the **main port**, supporting successful campaigns in Sri Lanka and the Maldives.
- **Administration:** Replaced hereditary lords with dependent officials and exercised **direct control over provinces**.
 - He strengthened the system of **local self-government** and installed a system of **audit and control** through which the public bodies were kept under watch.
- **Art & Culture:** Rajaraja Chola I was a dedicated **Shaivite**, but he also dedicated several temples to **Lord Vishnu**.
 - In **1010 CE**, Rajaraja Chola I built the grand **Brihadeshwara temple (Rajarajeshwaram temple)** at Thanjavur. It is dedicated to **lord Shiva** and a perfect example of **Dravidian temple architecture**.
 - The temple is part of the **UNESCO world heritage** and is known as one of the "**Great Living Chola Temples**" with the other two being the **Gangaikonda Cholapuram and Airavateshvara temple**.
 - An important piece of Chola sculpture was the **sculpture of Nataraja** in the **Tandava dance** posture.

- **Coinage:** Rajaraja Chola I introduced new **coins** featuring a standing king on one side and a seated goddess on the other, **replacing the old tiger-emblem coins**.
 - His coins were also **copied** by the kings of **Sri Lanka**.

Note: The Chola Empire was founded by **Vijayalaya** who led to the rise of the mighty Cholas by defeating the Pallavas.

- The reign of the **Cholas (9th-13th Century)** stretched over for over five long centuries until the 13th century.



What are Key Facts About the Chola Administration?

- **Centralised Governance:** At the top of the Chola administrative structure was the **king** whose powers were balanced by a **council of ministers**.
 - The Central Government under the king had a structured council with higher officials (Peruntaram) and lower officials (Siruntaram).
- **Provincial Administration:** The Chola Empire was divided into **nine provinces**, also called **Mandalams**.
 - The **Mandalams** were further subdivided into **Kottams** or **Valanadus**, which were further divided into **Nadus** (districts) and then into **Urs** (villages).
- **Revenue System:** The **land revenue** was the primary source of income with a general rate of **1/6th of the land yield** collected as tax, either in cash, kind, or both.

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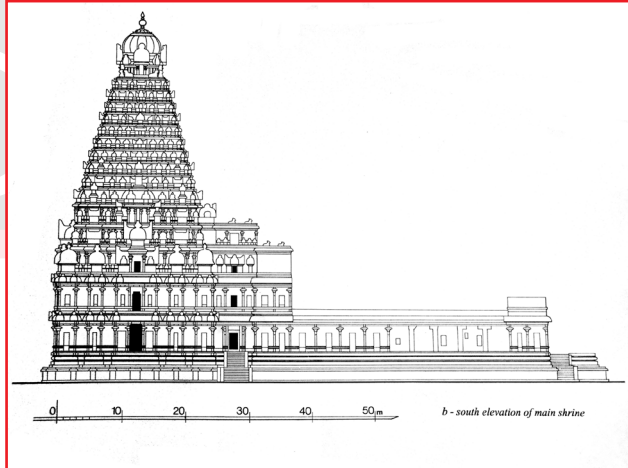
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- The Chola administration also levied taxes on **customs, tolls, mines, ports, forests, and salt pans**. **Professional and house taxes** were also collected.
- **Local Administration:** The most distinctive feature of the Chola administration was its **local governance** system, which granted substantial autonomy to local units like **Nadus** and **Villages**.
 - The **Nadu** was an important administrative unit, with its own assembly, and was headed by the **Nattar**, while the council of Nattars was called the **Nattavai**.
 - At the village level, the Grama Sabha was responsible for maintaining public infrastructure and regulating markets.
 - The **village assemblies** were assisted by various **Variyams** (committees) responsible for different aspects of local governance.
- **Trade under the Chola Dynasty:**
 - **Local Trade:** The Chola Empire saw significant development in **internal trade**, facilitated by **mercantile corporations** and organized guilds.
 - These guilds, often referred to as “**nanadesis**”, were powerful and autonomous bodies of merchants.
 - In large trade centers such as **Kanchipuram** and **Mamallapuram**, local **merchant organizations** called “**nagaram**” helped coordinate trade and market activities.
 - **Maritime Trade:** Chola dynasty established trade relations with **West Asia, China, and Southeast Asia**.
 - They were engaged in the lucrative trade of **spices, precious stones, textiles**, and other goods that were in demand across Asia.

What are the Key Facts About the Brihadisvara Temple?

- **About:** The temple, built by **Rajaraja I**, was inaugurated in his **19th year (1003-1004 CE)** and consecrated in his **25th year (1009-1010 CE)**.
- **Architectural Significance:** It exemplifies the pure form of **Dravidian temple design**.
- **Architecture:**
 - **Design:** Features a massive **colonnaded prakara (enclosure)** with sub-shrines dedicated to the **eight guardian deities (ashtadikpalas)**.

- **Gopuram:** Known as **Rajarajantiruvasal**, it serves as the **grand gateway** to the temple complex.
- **Circumambulatory Path:** A pathway surrounds the sanctum, allowing devotees to **perform pradakshina (circumambulation)** around the sacred shivlinga.
- **Artistic Elements:**
 - **Mural Paintings:** The temple walls are adorned with expansive and exquisite **mural paintings**, including **81 of the 108 karanas** (dance poses) from **Bharatanatyam**.
 - A Mural depicting **Raja Raja I** and his guru **Karuvuruvar** found in the **Brihadisvara temple**, Tamil Nadu.
 - **Inscriptions:** It contains inscriptions detailing **Rajaraja Chola I's military achievements, temple grants, and administrative orders**.



What are the Key Facts About the Nataraja Statue?

- **About:** The **Nataraja statue** symbolizes **Lord Shiva** as the **cosmic dancer**, embodying the **creation, preservation, and destruction** of the universe.
- **Historical Origin:** The earliest sculptures of Nataraja date back to the **5th century CE**.
 - The iconic and world-famous form evolved during the Chola dynasty's reign (**9th–13th century CE**), showcasing their **artistic and cultural advancements**.
- **Cosmic Dance:** Known as **Ananda Tandava (Dance of Bliss)**, it represents the eternal rhythm of the universe, the cycle of creation and destruction, and the perpetual flow of time.

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➤ Key Symbolic Features:

- **Flaming Halo (Prabhamandala):** Represents the **cosmos and the cycle of time**, destruction, and renewal.
- **Damaru (Upper Right Hand):** The hand drum symbolizes the first sound of **creation** and the rhythm of the universe.
- **Agni (Upper Left Hand):** The flame signifies **destruction**, marking the end of the cosmic cycle.
- **Abhayamudra (Lower Right Hand):** A gesture of **reassurance and protection**, dispelling fear.
- **Left-Hand Gesture:** Points to the raised left foot, symbolizing **refuge and liberation** for the troubled soul.
- **Apasmara Purusha:** The dwarf figure under Shiva's right foot represents **ignorance or illusion (maya)** that leads humans astray.
- **Raised Left Foot:** Represents grace and the path to **salvation**.



- **Chola Contributions:** The Chola bronzes are renowned for their **finesse, intricate detailing, and spiritual symbolism**.
 - It was crafted in bronze, showcasing the expertise of Chola-era metallurgists and artists.
- **Recognition:** A replica of the Nataraja statue stands outside **CERN (European Organization for Nuclear Research)**, symbolizing the cosmic dance of particles in physics.

Maritime Activity Under the Chola Rule

- **Naval Power:** The Cholas built a **powerful navy** that extended to distant shores to conquer territories, promoting mercantile interests.
- **Ports:** Key ports include **Mamallapuram (Mahabalipuram)**, Kaveripattinam, Nagapattinam, Kancheepuram, Kulachal, and Thootukodi.

- **Invasion of Southeast Asia:** King Rajendra I's invasion of the **Sailendra Empire** (Southeast Asia) brought the **Malay Peninsula, Java, and Sumatra** under Chola control.
 - The Cholas thwarted Chinese attempts to disrupt their trade with Southeast Asia.
- **Shipbuilding: Kappal Sattiram**, a treatise on **shipbuilding**, highlights their advanced maritime technology.

Megalithic Footprints and Human Figure

Why in News?

Recently, **24 pairs of prehistoric Megalithic footprints and a human figure** have been discovered in Madikkai, Kerala which is believed to date back to the **Megalithic period**.

What are the Key Highlights of Findings?

- **Cultural Significance:** All footprints point **westward**, potentially signifying their **symbolic importance**.
 - Archaeologists interpret them as representing the **souls of deceased individuals**, while local residents attribute them to a **goddess**.
- **Age:** It is estimated to be over **2,000 years old**, adding depth to the historical narrative of Kerala.
- **Other Discoveries:** It resembles **prehistoric rock art** found at **Avalakki Pera** in Udupi district, **Karnataka**.
 - **Prehistoric** discoveries in Kerala include:
 - Temple decorations at **Erikulam valiappara** in Kasaragod.
 - **Running tiger** carvings in Neeleswaram.
 - **Human figures** at Cheemeni Ariyittapara.
 - **Bull figures** at Ettukudukka in Kannur.
 - **Edakkal Caves** carvings in Wayanad.

Note: Prehistoric refers to the period of human history **before** the existence of **written records**. It encompasses the time from the **earliest human existence** to the advent of writing systems, which generally predates **3000 BCE**.

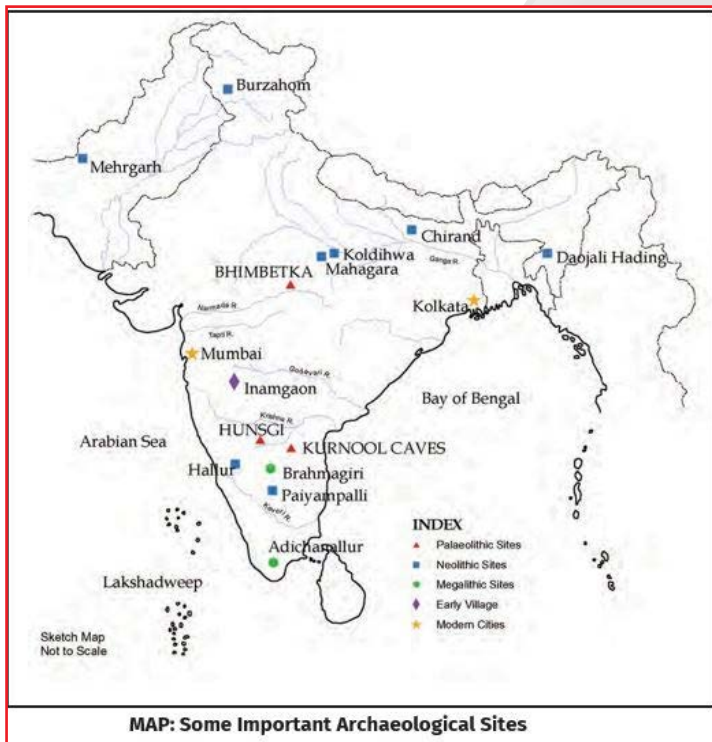
What is Megalithic Culture?

- **About:** Megalithic Culture refers to a **prehistoric** cultural tradition characterized by the construction of

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large stone structures or monuments, known as megaliths.

- **Chronology of Megaliths:** The **Brahmagiri excavation** dates South India's megalithic cultures to between the **3rd century BC and 1st century AD**.
- **Geographical Distribution:** The main concentration of megalithic culture is in **Deccan**, especially south of the **Godavari River**.
 - It has been found across the Punjab Plains, Indo-Gangetic basin, Rajasthan, Gujarat, and **Burzahom** in Jammu and Kashmir, with key sites including **Seraikala (Bihar)**, **Khera (Uttar Pradesh)**, and **Deosa (Rajasthan)**.
- **Use of Iron:** The Megalithic period in South India marked a full-fledged **Iron Age culture**, where iron technology was fully utilized.
 - It is evidenced by **iron weapons and agricultural implements** discovered from **Junapani** in Vidarbha to **Adichanallur** in Tamil Nadu.
- **Rock Paintings:** **Rock paintings** found at megalithic sites depict scenes of hunting, cattle raids, and group dancing.



Children's Day and Pt. Jawaharlal Nehru

Why in News?

Children's Day 2024 (Bal Diwas), is celebrated annually on 14th November to honour the **birth anniversary of Jawaharlal**

Nehru, the first Prime Minister of India, born on 14th November 1889.

- **Nehru (affectionately called Chacha Nehru)** is remembered for his strong bond with children and his significant contributions to their welfare.

What is the History and Significance of Children's Day?

- **Children's Rights and Development:** The day is observed to raise awareness about the rights and welfare of children, focusing on their **education, health, nutrition, and overall development**.
- **Earlier Observance of World Children's Day:** World Children's Day was first **established in 1954 as Universal Children's Day** and is celebrated on **20th November** each year to promote international togetherness, and awareness among children worldwide to improve children's welfare.
 - **20th November** is notable for the **UN's** adoption of the **Declaration of the Rights of the Child in 1959** and the **Convention on the Rights of the Child in 1989**.
 - Following the death of Jawaharlal Nehru in 1964, the **Government of India** decided to dedicate **14th November** as **Children's Day** to honour Nehru's legacy and his commitment to children's issues.

Significance of Children's Day:

- Children's Day underscores the importance of children's rights, including education, protection from exploitation, and healthcare, while emphasising quality education and programs like the **Right to Education Act, 2009, Integrated Child Development Services (ICDS)** for holistic development.
- India's policies on child welfare align with international conventions such as the **United Nations Convention on the Rights of the Child (UNCRC)**

What are the Contributions of Pt. Jawaharlal Nehru?

- **Pre-Independence Era (1889-1947):**
 - Nehru entered politics in 1912, attending the **27th Congress session** at **Bankipore**

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Congress as a delegate and became **Home Rule League Secretary in 1919**.

- He organised the **first Kisan March** in Pratapgarh, Uttar Pradesh, in 1920 and was twice imprisoned during the 1920-22 **Non-Cooperation Movement**.
- He became **General Secretary of the All India Congress Committee (AICC)** in 1923.
- In 1926, Nehru committed the Congress to independence at the Madras Congress. In 1928, he was lathi-charged while leading a procession against the **Simon Commission** in Lucknow.
- In 1928, Nehru played a crucial role in **drafting and signing the Nehru Report (drafted by Motilal Nehru)**, which was a proposal for constitutional reforms in India.
- Nehru also established the **Independence for India League** in 1928, aiming to advocate for full independence from British rule.
- In 1929, at the **Lahore Congress**, Nehru was elected **President**, and the Congress officially adopted complete independence as its goal (known as the **Purna Swaraj Resolution**).
- On 7th August 1942, Nehru moved the **Quit India Resolution** at the **All-India Congress Committee (AICC) session in Bombay**.

➤ **Achievements of Jawaharlal Nehru as Prime Minister:**

- **Vision for Modern India:** During his tenure as **India's first Prime Minister (1947–1964)**, Nehru established a modern democratic state, promoted secularism and scientific advancement, and laid the foundations for industrialisation.
- **Social Reforms:** At its core, the **Hindu Code Bill** aimed to replace religious laws with a secular civil code. It sought to **outlaw polygamy, grant women property and divorce rights**, amend inheritance laws, and introduce inter-caste marriage provisions.
 - **Tribal Panchsheel:** Jawaharlal Nehru's **Tribal Panchsheel emphasised self-development, respect for tribal rights**, minimal external imposition, local participation in administration, and human-centred outcomes over financial metrics.

○ **Economic Development and Institutions:** Nehru established key institutions like **IITs**, the **Indian Institute of Management**, the **Indian Space Research Organisation (ISRO)**,

- These institutes are essential for India's economic growth and emphasise industrialization through the **Five-Year Plans** for self-sufficiency.
- He championed the development of a scientific temperament to fight religious obscurantism and superstition, continuing the legacy of social reformers like **Raja Ram Mohan Roy**.

○ **Institutionalisation of Democracy:** Nehru's '**Objective Resolution**' guided the **Constituent Assembly** in drafting the constitution, shaping the preamble and significantly deciding the philosophy of the **Constitution of India**.

○ **Foreign Policy of Nonalignment:**

- **NAM:** Nehru's nonalignment policy aimed to keep India neutral during the **Cold War**. He was pivotal in forming the **Non-Aligned Movement**, promoting global peace at the **Bandung (1955)** and **Belgrade (1961)** conferences.

● **Panchsheel Principle:** Also known as the Five Principles of Peaceful Coexistence, are a set of principles that were jointly formulated by India and China in the 1950s. It includes

- Mutual Respect for Each Other's Territorial Integrity and Sovereignty.
- Mutual Non-Aggression.
- Mutual Non-Interference in Each Other's Internal Affairs.
- Equality and Mutual Benefit.
- Peaceful Coexistence.
- Criticisms of Nehruvian Policy:

○ **Kashmir Dispute:** Nehru's foreign policy focused on the Kashmir issue, seeking UN support **post-1947 partition**, but struggled to resolve the conflict with Pakistan.

○ **Goa Liberation:** In 1961, Nehru's military action to liberate Goa from Portuguese rule faced international criticism but was seen as a justified anti-colonial step.

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- **The 1962 Sino-Indian War:** Nehru's failure to modernise or upgrade Indian forces before the **1962 Sino-Indian War** highlighted the need for enhanced defence measures, forcing a reevaluation of India's military preparedness and strategic approach.
- **Legacy:**
 - Nehru's **secular, socialist approach** shaped India's post-independence trajectory, laying the groundwork for a modern nation despite challenges like the **Kashmir issue** and the **Sino-Indian war**.
 - Nehru's secularism fostered humanistic values and national development. His ideas, rooted in Indian tradition, emphasised religious equality, humanism, and universal ethics.
 - Nehru unified India's diverse communities, promoting policies to balance traditional diversity with modern governance.
 - Nehru concluded that the government must sustain religious diversity, aligning with the idea of separating religion from politics.

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Art and Culture

Highlights

- Maha Kumbh Mela 2025
- Miniature Paintings
- Folk Dance Yakshagana
- Prakash Parv of Guru Nanak Dev Ji

Maha Kumbh Mela 2025

Why in News?

The Maha Kumbh Mela 2025, a sacred pilgrimage, will be held in Prayagraj from **13th January to 26th February 2025**, drawing millions of pilgrims for spiritual purification, cultural celebration, and unity.

- The word '**Kumbh**' comes from the root '**kumbhak**' (the sacred pitcher of elixir of immortality).

What are the Key Facts About Kumbh Mela?

➤ About:

- It is the largest peaceful congregation of pilgrims on earth, during which participants bathe or take a dip in a sacred river. This gathering takes place at 4 different places, namely:
 - In **Haridwar**, on the banks of the **Ganges**.
 - In **Ujjain**, on the banks of **Shipra**.
 - In **Nashik**, on the banks of **Godavari** (Dakshin Ganga).
 - In **Prayagraj**, at the confluence of the Ganges, the Yamuna, and the mythical invisible **Saraswati**.

➤ Different Types of Kumbh:

- The **Kumbh Mela** is celebrated **4 times over a course of 12 years**.
- At **Haridwar and Prayagraj**, **Ardh-Kumbh** Mela is held **every 6th year**.
- The **Maha Kumbh Mela** is celebrated at Prayag after 144 years (after 12 'Purna Kumbh Melas').
- **Maagh Kumbh** is celebrated **every year** in the month of **Maagh (Jan-Feb)** in **Prayagraj**.

➤ Historical Evolution:

- **Background:** The Maha Kumbh Mela, transcribed by **Adi Shankaracharya**, originates from the

Puranas, describing gods and demons battling for the sacred pitcher of Amrit, with Lord Vishnu (as Mohini) securing it from demons.

- **Ancient Origins:** During the **Maurya and Gupta periods** (4th century BCE to 6th century CE), the Kumbh Mela began as smaller gatherings of pilgrims from across the Indian subcontinent.

- Its significance increased with the rise of **Hinduism**, particularly under rulers like the **Guptas** who elevated its status.

- Harshavardhana king of the Pushyabhuti dynasty started the organisation of the Kumbh fair at Prayagraj.

- **Medieval Patronage:** Supported by royal dynasties like the Chola and **Vijayanagar empires**, **Delhi Sultanate**, and **Mughals**.

- Akbar promoted religious tolerance and granted **Naga Sadhus** the honour of leading the **royal entry to the Mela in 1565**.

- **Colonial Period:** British administrators, fascinated by the Kumbh Mela's scale and diversity, observed and documented the festival.

- In the 19th century, **James Prinsep** chronicled its ritualistic practices and socio-religious dynamics.

- **Post-Independence Significance:** The Kumbh Mela symbolises national unity and India's cultural heritage, **recognized by UNESCO in 2017 as an intangible cultural heritage of humanity** for its enduring ancient traditions.

➤ Kumbh 2019 Created 3 Guinness World Records:

- Largest traffic and crowd management plan.
- The biggest painting exercise of public sites under the **Paint My City Scheme**.
- Biggest sanitation and waste disposal mechanism.

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➤ **Significance of Kumbh:**

- **Spiritual Relevance:** Bathing at the **Triveni Sangam** (Ganges, Yamuna, Sarasvati confluence) is believed to purify sins and lead to spiritual liberation (**Moksha**).
- **Cultural Showcase:** At the Kumbh Mela, devotional kirtans, bhajans, and traditional dances like **Kathak**, **Bharatanatyam**, and **Kuchipudi**, highlight themes of spiritual unity and divine love.
- **Astrological Timing:** Determined by the alignment of the **Sun, Moon, and Jupiter**, making the event highly auspicious for spiritual activities.
 - At **Nashik and Ujjain**, if the mela is held when a planet is in **Leo (Zodiac)**, it is called **Simhastha Kumbh**.

➤ **Rituals and Activities:**

- **Shahi Snan (Royal Bath):** Procession of saints and **Akharas (spiritual orders)** performing ceremonial baths. Also known as 'Rajyogi Snan,' it signifies the **start of the Maha Kumbh Mela**.
 - The word 'akhara' originates from 'akhand,' meaning indivisible. **Adi Guru Shankaracharya** sought to unify ascetic organisations to safeguard the 'Sanatan' way of life.

- **Akharas** symbolise social order, unity, culture, and ethics, focusing on spiritual and ethical values. They emphasise virtue, morality, self-restraint, compassion, and religiosity, and are symbols of unity in diversity.

- Akharas can be categorised based on their favoured deity.

- **Shaiva Akharas:** Worship Lord Shiva in various forms.

- **Vaishnava Akharas:** Worship Lord Vishnu in various forms.

- **Udaseen Akharas:** Founded by Chandra Dev (son of **Guru Nanak**, the first Sikh Guru).

- **Peshwai Processions:** A grand spectacle featuring the traditional procession of Akharas, known as 'Peshwai,' which includes participants on elephants, horses, and chariots.

- **Spiritual Discourses:** The event features spiritual discourses led by revered saints and spiritual leaders, alongside a vibrant convergence of Indian music, dance, and crafts.

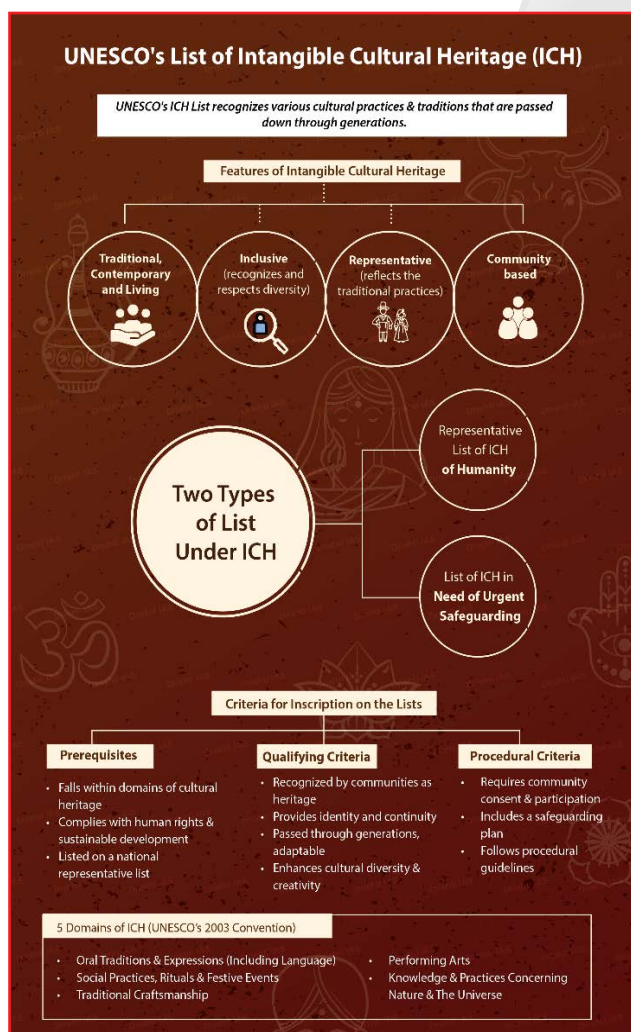
UNESCO List of Intangible Cultural Heritage of Humanity

- This coveted list is made up of those intangible heritage **elements that help demonstrate the diversity of cultural heritage** and raise awareness about its importance.
- The list was established in **2008 when the Convention for Safeguarding of the Intangible Cultural Heritage** came into effect.
- **Intangible Cultural Heritage of India, recognised by UNESCO:**
 - **Intangible cultural heritage** is the practices, expressions, knowledge and skills that communities, groups and sometimes individuals recognise as part of their cultural heritage.
 - Also called **living cultural heritage**, it is usually expressed in one of the following forms:
 - Oral Traditions
 - Performing Arts
 - Social Practices
 - Rituals and Festive events
 - Knowledge and Practices concerning nature and the universe
 - Traditional Craftsmanship

S.No.	Intangible Cultural Heritage Element	Year of Inscription
1	Kutiyattam, Sanskrit Theater	2008
2	Tradition of Vedic Chanting	2008
3	Ramlila, the Traditional Performance of the Ramayana	2008

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4	Ramman, Religious Festival and Ritual Theatre of the Garhwal Himalayas, India	2009
5	Chhau Dance	2010
6	Kalbelia Folk Songs and Dances of Rajasthan	2010
7	Mudi yettu, Ritual Theatre and Dance Drama of Kerala	2010
8	Buddhist Chanting of Ladakh: Recitation of Sacred Buddhist Texts in the Trans-Himalayan Ladakh region	2012
9	Sankirtana, Ritual Singing, Drumming, and Dancing of Manipur	2013
10	Traditional Brass and Copper Craft of Utensil Making among the Thatheras of Jandiala Guru, Punjab	2014
11	Nowruz	2016
12	Yoga	2016
13	Kumbh Mela	2017
14	Durga Puja in Kolkata	2021
15	Garba of Gujarat	2023



S.No	ICH of India	Year of Inscription	Description
1	Garba of Gujarat	2023	Traditional dance from Gujarat performed during Navratri
2	Durga Puja in Kolkata	2021	Grand Hindu festival with elaborate rituals & Durga's artistic displays
3	Kumbh Mela	2017	Hindu pilgrimage & festival → Largest peaceful congregation on earth
4	Nowruz	2016	Parsi New Year
5	Yoga	2016	Ancient Indian practice uniting mind, body, & spirit
6	Traditional Brass & Copper Craft of Utensil Making Among the Thatheras of Jandiala Guru, Punjab	2014	An Oral tradition passed onto generations of Thathera community
7	Sankirtana	2013	Storytelling of Krishna with singing, drumming, & dancing Region → In Manipur
8	Buddhist Chanting of Ladakh	2012	Sacred Buddhist recitation in Ladakh monasteries
9	Mudi yettu	2010	Dance drama of goddess Kali's battle with demon Darika Region → Kerala
10	Kalbelia Folk Songs & Dances of Rajasthan	2010	Known for fluid, snake-like movements
11	Chhau Dance	2010	Tribal martial art dance blending folk traditions of eastern India
12	Ramman	2009	Religious Festival & Ritual Theatre of The Garhwal Himalayas
13	Ramlila	2008	The Traditional Performance of The Ramayana
14	Tradition of Vedic Chanting	2008	Oral tradition preserving Vedic chants with precision
15	Kutiyattam, Sanskrit Theatre	2008	Ancient theatre → merging rituals & drama Region → Kerala

All these elements of ICH from India are included in UNESCO's List of the Intangible Cultural Heritage of Humanity.

Note:

Miniature Paintings

Why in News?

A recent New Delhi exhibition showcased the evolving relevance and global interpretations of South Asian **miniature painting**, featuring 20 diverse artists and emphasizing its dynamic cultural significance.

What are Miniature Paintings?

➤ About:

- The term 'miniature' comes from the Latin 'Minium,' meaning red lead paint, used in Renaissance illuminated manuscripts.
- These small, detailed paintings are typically no larger than 25 square inches, with subjects painted at 1/6th of their actual size. Common features include bulging eyes, pointed noses, and slim waists.

➤ Early Miniature: Early miniature paintings were initially less refined, featuring minimal decoration. Over time, they evolved to include more detailed embellishments, ultimately becoming similar to today's miniature paintings.

- They were **often painted for either books or albums**, on perishable material including paper, palm leaves and cloth. These paintings developed between the **8th and 12th centuries** and can be attributed to the eastern and western regions. Two prominent schools of early miniature paintings are:
 - **Pala School of Art:** This school was flourishing during **750-1150 AD**. These paintings are generally found as a part of **Buddhist manuscripts** and were generally executed on palm leaf or vellum paper.
 - These paintings are characterised by **sinuous lines and subdued tones** of the background imagery. There are lonely single figures in the paintings and one rarely finds group paintings.
 - The proponents of the **Vajrayana school of Buddhism** also used and patronised these paintings.
 - **Apabhramsa School of Art:** This school originated in **Gujarat and Mewar**, Rajasthan, dominating western Indian painting **from the 11th to 15th centuries**. Initially focusing on **Jain themes**, it later incorporated **Vaishnava subjects**.



Apabhramsa school of art

- **Miniature Art During Delhi Sultanate:** These paintings tried to bring together the Persian elements of their origins with the Indian traditional elements.
 - An example is the **Nimatnama, a cookery book** created during the reign of Nasir Shah, who ruled Mandu.
- **Mughal Era Miniature Painting:** The paintings made in the Mughal period had a distinctive style as they were drawn from Persian antecedents.
 - Mughal art is recognized for its **diverse subjects beyond religious themes**. The emphasis shifted from depicting gods to glorifying rulers and their lives. Artists focused on hunting scenes.
 - They brought the technique of foreshortening to the Indian painter's repertoire. Under this technique, **"objects were drawn in a way that they look closer and smaller than they really are"**.
 - **Contribution of Mughal Rulers:**
 - **Akbar:** Founded Tasvir Khana, an artistic studio and promoted calligraphy.
 - **Jahangir:** Mughal painting peaked, favoring naturalistic themes (flora and fauna) and decorated margins. Example: **Zebra and cock paintings**.
 - **Shah Jahan:** Inspired by European art, it introduced stillness and pencil sketching while incorporating more gold, silver, and brighter color palettes.
- **Miniatures in South India:**
 - **Tanjore Paintings:** It is famous for decorative paintings. The **Maratha rulers** patronized them **during the 18th century**.
 - **Mysore Paintings:** Mysore Paintings **depict Hindu gods and goddesses**. They uniquely feature

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multiple figures, with **one figure dominating in size and color**.

➤ **Regional Schools of Art:**

○ **Rajasthani Schools of Painting:**

- **Mewar School of Painting:** Mewar painting is dominated by the extraordinary figure of Sahibdin.
- **Kishangarh School of Painting:** Paintings were associated with the most romantic legends – **Sawant Singh and his beloved Bani Thani**, and of the **intertwining of lives and myths, romance and bhakti**.

- **Pahari Styles of Painting:** This style of painting developed in the sub-himalayan states: **Jammu or Dogra School** (Northern Series) and **Basholi & Kangra School** (Southern Series).

➤ **Modern Paintings:** During the **colonial period**, Company Paintings emerged, **blending Rajput, Mughal, and Indian styles with European elements**. British officers employed Indian-trained painters, mixing European tastes with Indian techniques.

- **Bazaar Paintings:** This school was also influenced by the **European encounter in India**. They were different from the Company paintings as that school mixed European techniques and themes with Indian ones.
- **Bengal School of Art:** This school had a reactionary approach to the existing styles of paintings in the **1940s–1960s**. They used simple colours.
- **Cubist Style of Painting:** Inspired by **European Cubism**, in which objects were broken, analyzed, and reassembled using abstract forms, balancing line and color.

What are the Socio-Economic Impacts of Reviving Miniature Painting?

- **Economic Opportunities:** The resurgence of interest in miniature painting creates job opportunities for artists and artisans, contributing to local economies.
 - Art exhibitions **promote sales of artworks**, boosting income for participating artists.
- **Cultural Tourism:** Miniature paintings attract tourists interested in cultural heritage, enhancing tourism revenue.
 - Regions with rich miniature art traditions, like **Rajasthan**, can leverage tourists avenues to promote local crafts.

- **Community Engagement:** Workshops and exhibitions foster community involvement and awareness about traditional arts.

- Educational programs can equip younger generations with the **knowledge and techniques to master** and sustain these traditional skills.

How does Painting Reflect the Cultural Identities of the Time?

- **Historical Context:** Miniature painting has roots in the **Mughal, Rajput, and Persian traditions**, flourishing between the **16th and 17th centuries**.

- It served as a **medium for storytelling**, capturing both sacred and secular narratives with intricate details.

- **Regional Diversity:** India's diverse painting styles reflect **local socio-religious outlook**.

- **Example:** Apabhramsa School of Art **depicts Jain and Vaishnava subjects**.

- **Government initiatives:** Projects like the '**Ghar Ghar Museum**' preserve local art by encouraging community museums, maintaining traditional art forms, and fostering cultural identity and pride.

- **Contemporary Interpretations:** Artists today reinterpret traditional themes through modern lenses, addressing contemporary issues such as identity, spirituality, and socio-political commentary.

- **Social Commentary:** Paintings confront vital social issues such as gender roles, caste discrimination, and political unrest.

- Visionaries like **Abanindranath Tagore (Bengal School of Art)**, celebrated for his painting **Bharat Mata**, championed a resurgence of indigenous art styles, resisting Western influences.

- **Cultural Preservation vs. Innovation:** While preserving traditional techniques, contemporary artists experiment with new motifs and mediums (**e.g., digital art**).

- This dual approach ensures that miniature painting remains vibrant and relevant in today's art scene.

What Actionable Strategies Can Support the Growth of Miniature Painting?

- **Government Support:** Policies offering grants and subsidies to financially support artists. Creating dedicated art funds can enhance research, training, and exhibitions for miniature painting.

Note:



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- **Educational Initiatives:** Adding miniature painting to school curricula can foster appreciation among youth. Collaborating with art institutions can offer training programs combining traditional and contemporary techniques.
 - The **Sahitya Akademi** holds nationwide workshops to promote regional art, enhancing and showcasing artists' skills.
- **International Collaborations:** Partnerships with international galleries and global art fairs can provide platforms for Indian artists to showcase their work globally.
- **Digital Platforms:** Utilising online platforms for monetising artworks can expand market reach beyond local boundaries.
 - Social media campaigns can raise awareness about miniature painting's significance and attract a broader audience.

Folk Dance Yakshagana

Why in News?

Tulasi Raghvendra Hegde, a 15-year-old prodigy, has gained recognition as a leading **Yakshagana performer**. Recently awarded the Young Achiever Award 2024 by the Rotary Club of Madras East.



What is Yakshagana?

- **About:** Yakshagana is a traditional folk dance-drama from **coastal Karnataka**, combining **dance, music, song, and elaborate costumes**.
 - Its name, "Yakshagana" translates to "**celestial music**" (**Yaksha meaning celestial and Gana meaning music**). and it presents a celestial world through scholarly dialogues and night-long performances.

- Yakshagana performances are held in **open-air theatres**, often in village paddy fields, after harvest. Traditionally performed by men, women are now increasingly part of Yakshagana **Melas**(troupes).
- **Key Elements of Yakshagana:**
 - **The Act:** Each performance focuses on a sub-story (**Prasanga**) from ancient Hindu epics like the **Ramayana or Mahabharata**.
 - These performances combine stage acting and commentary, with a lead singer or **Bhagavatha** narrating the story, accompanied by traditional music.
 - **The Music:** Yakshagana music features instruments like **Chande** (drums), Harmonium, Maddale, **Taala** (mini metal clappers), and flute, creating a rhythmic atmosphere for the dancers.
 - **The Dress:** Performers wear elaborate and unique costumes, including large headgear, colorful face paint, body costumes, and musical beads on the legs (**Gejje**).
 - These costumes are heavy, requiring great strength, and the performances last several hours.

Folk Dance

- **About:** It is a traditional dance form passed down through generations, reflecting the community's customs, rituals, and daily life, serving to express identity and transmit cultural heritage.
- **Major Folk Dances of India:**

Region	Folk Dance Form
Andhra Pradesh	Burrakatha, Butta Bommalu
Assam	Bihu
Bihar	Biraha, Jat-Jatin
Chhattisgarh	Gaur Maria, Raut Naach
Goa	Tarangamel, Fugdi
Gujarat	Garba
Himachal Pradesh	Charba
Jammu & Kashmir	Dumhal
Jharkhand	Chhau (Saraikella)
Karnataka	Yakshagana, Bhootha Aradhane, Pata Kunita
Kerala	Kummi, Kolkali-Parichakali, Padayani, Kaikottikali, Chakyar koothu, Mayilattam

Note:

Madhya Pradesh	Jawara
Manipur	Thang Ta
Mizoram	Cheraw
Nagaland	Rangma
Odisha	Chhau (Mayurbhanj), Paika, Jhumar, Danda-Jatra, Dalkhai
Punjab	Bhangra, Giddha, Jhoomar
Rajasthan	Ghoomar, Kalbelia
Sikkim	Singhi Chham
Tamil Nadu	Kummi, Mayilattam
Uttar Pradesh	Raslila, Dadra
West Bengal	Chhau (Purulia), Alkap

Classical Dances of India

→ The first well-known source to address classical dances is Bharat Muni's work **Natya Shastra**.

Two basic aspects

Lasva

- Signifies **bhava, rasa, abhinaya**, and **grace**.
- Symbolic to the **feminine** features of dance.

Landava

- More focus on **movement** and **rhythm**.
- Symbolic to the **male** aspects of dance.

Three main elements (Nandikeshwara's Abhinaya Darpan)

Nritya

- Basic dance moves.
- Rhythmically performed.
- No emotion or expression at all.

Natya

- Dramatic representations.
- The dance performance elaborates on the story.

Nritya

- Sentiment and the emotions evoked through dance.
- Different methods of expression or mudras in the dance.

→ There are **108 primary mudras**, each of which is used to express a different emotion.

→ According to the **Sangeet Natak Akademi**, there are **eight classical dance forms** in India.

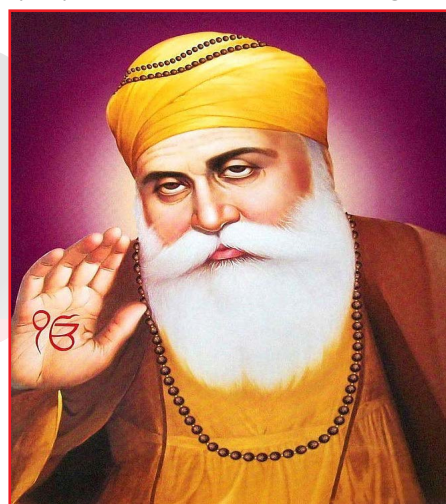


Prakash Parv of Guru Nanak Dev Ji

Why in News?

Recently, the **President** of India greeted citizens on the eve of **Prakash Parv of Guru Nanak Dev Ji**, urging them to adopt his teachings and promote **unity and equality** in society.

- Prakash Parv is celebrated on the **birth anniversary of Guru Nanak Dev Ji** which falls on the Kartik Purnima, 15th lunar day in the month of Kartik, according to the Hindu calendar.
- It is celebrated as **Prakash Parv** because he tried to take people from **darkness towards light**.



What are Key Facts About Guru Nanak Dev?

- **Birth and Early Life:** Guru Nanak (1469-1539) was born in **1469** in **Talwandi village**, near **Lahore** in **Pakistan**.
 - He was the **first of the 10 Sikh gurus**.
 - He worked as a **clerk** in **Sultanpur** in the **Lodi administration**.
- **Spiritual Revelation:** Around the **age of 30**, Guru Nanak had a profound **spiritual experience** and a direct encounter with **God** near a river **Kali Bein**, leading him to declare, **"There is neither Hindu nor Muslim."**
- **Philosophical Inspiration:** He was a proponent of the **Nirguna School** of the **Bhakti movement** and was influenced by **Kabir Das**. He emphasised spiritual practices like **"Nam Japna"** i.e., the repetition of God's name to experience God's presence.

Note:

- **Teachings and Travels:** He travelled extensively across **India and the Middle East**, spreading his message with his Muslim companion, **Mardana**.
 - The **hymns** composed by him were incorporated in the **Adi Granth** by the **fifth Sikh Guru Arjan** in **1604**.
- **Community and Legacy:** He settled in **Kartarpur** and established the **first Sikh community** where disciples lived and worshipped together.
 - He appointed **Guru Angad (Bhai Lehna)** as his **successor** to lead the community.

Bhakti Movement

- **About:** Bhakti movement advocated **devotional surrender** to a personally conceived supreme God for attaining salvation.
- **Concept of Bhakti:** In the **Shvetashvatara Upanishad**, Bhakti simply means participation, devotion and love for any endeavour.
 - The **Bhagvada-Gita** stresses the importance of having unwavering faith in God.
- **Origin:** The Bhakti movement began in **South India** during the **7th to 8th centuries AD**, initiated by the **Nayanars** (devotees of Shiva) and **Alvars** (devotees of Vishnu).
 - The movement spread from **South India** to **North India**, aided by the use of **local languages** by saints to communicate their teachings.
- **Social and Religious Reforms:** Bhakti saints preached **equality of all human**, regardless of **caste, class, or religion**.
- **Prominent Bhakti Saints:** Saints associated with the Bhakti movement include **Ramdas, Mirabai, Tulsidas, Namdev, Tukaram, Ramanuja, Kabir, Nanak**, and others.
 - **Kabir** and **Guru Nanak** played pivotal roles in **bridging the gap** between **Hindus** and **Muslims** by drawing from both Hindu and Islamic traditions.

What are the Teachings of Guru Nanak?

- **Ek Omkar (Monotheism):** Guru Nanak emphasised that there is **one God** who is **omnipresent**, and all humans are children of this one God.
- **Naam Jap (Chanting the Name of God):** He promoted **remembering and chanting God's name** to eliminate

darkness, bring peace and happiness, and instil values of **kindness and love**.

- **Working with Honesty:** Guru Nanak stressed the importance of **working honestly** and earning through **fair means**. Honest labour brings **blessings**, a sense of **satisfaction**, and **self-confidence**.
- **Wand Chhako (Sharing and Service):** He taught the practice of **sharing a portion of one's earnings** with the needy to foster societal equality and compassion.
- **Attitude Towards Other Religions:** Guru Nanak respected **all religions** and **believed all humans were equal**, rejecting judgement based on religious differences.
 - With a deep understanding of texts like the **Vedas, Quran, and Bible**, he showed equal respect for each faith.
- **Idol Worship:** Nanak **rejected idol worship**, believing that God cannot be found in idols. He taught that **God is infinite**, beyond human words, symbols, or forms, and cannot be defined by man-made idols.
 - Guru Nanak was the main **proponent of the Nirguna ('formless God') tradition** of the **Bhakti movement**.
- **Salvation:** Guru Nanak believed that **good deeds** help the **soul merge with the eternal soul**, while bad deeds hinder it.
 - Meditation in God's name is key to **salvation**, which means freedom from rebirth and union with God.
- **Brotherhood and Equality:** Guru Nanak **opposed** any form of **discrimination** based on **caste, religion, or class**.
 - He believed in the **inherent equality** of all people and preached that everyone deserves equal love and respect.
- **Detachment from Materialism:** He advocated against attachment to **material possessions** and encouraged **spiritual development** and devotion to God to create a just and ideal society.
- **Respect for Women:** Guru Nanak emphasised the **equality and respect of women**, standing against **gender discrimination** and advocating for their dignity and equal treatment.

Note:



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Precious Words of Guru Nanak Dev Ji

- If you can keep your **mind calm**, you will **conquer the world**.
- **Speak** only that which brings you **respect**.
- **One-tenth** of your **income** should be devoted to **charity** and **one-tenth** of your **time** should be devoted to devotion to **God**.
- Always be ready to **help others** because when you help someone, **God helps you**.
- Only one who has **faith in himself** can believe in God.

Sikh Gurus and their Major Contributions

Guru	Period	Key Contributions
Guru Nanak Dev	1469-1539	Founder of Sikhism; started GURU KA LANGAR ; contemporary of Babur ; 550 th birth anniversary commemorated with Kartarpur corridor .
Guru Angad	1504-1552	Invented Guru-Mukhi script ; popularised GURU KA LANGAR .
Guru Amar Das	1479-1574	Introduced Anand Karaj Marriage ; abolished Sati and Purdah ; contemporary of Akbar .
Guru Ram Das	1534-1581	Founded Amritsar in 1577 ; initiated construction of Golden Temple .
Guru Arjun Dev	1563-1606	Composed Adi Granth in 1604 ; completed Golden Temple ; executed by Jahangir .
Guru Hargobind	1594-1644	Transformed Sikhs into a military community ; established Akal Takht ; waged wars against Jahangir and Shah Jahan .
Guru Har Rai	1630-1661	Promoted peace with Aurangzeb ; focused on missionary work.
Guru Har Krishan	1656-1664	Youngest guru; summoned by Aurangzeb for anti-Islamic blasphemy.
Guru Teg Bahadur	1621-1675	Founded Anandpur Sahib , Beheaded on the orders of Mughal Emperor Aurangzeb in 1675 .
Guru Gobind Singh	1666-1708	Founded Khalsa in 1699 ; introduced Pahul (Baptism ceremony) ; last guru to pass Guruship to Guru Granth Sahib .

■■■

Note:

Geography

Highlights

- Global Soil Conference 2024 and Soil in India
- Global Decline in Freshwater Reserves

Global Soil Conference 2024 and Soil in India

Why in News?

Recently, the **Global Soil Conference (GSC) 2024** was held in New Delhi, highlighting the importance of **soil health** for **food security, climate change mitigation**, and ecosystem services.

What is the Global Soil Conference 2024?

- **About:** The GSC 2024, organised by the **Indian Society of Soil Science (ISSS)** in collaboration with the **International Union of Soil Sciences (IUSS)**, aims to address challenges in sustainable soil/resource management.
 - The event aimed to foster a global dialogue on how caring for soils can drive sustainability across various sectors.
- **Theme:** *Caring Soils Beyond Food Security: Climate change mitigation & Ecosystem Services.*
- **Key Highlights of GSC 2024:** Soil health was recognized as a pressing issue, with soil degradation affecting productivity and posing a **threat to global food security**.
 - Around **30% of India's soil is reportedly compromised** due to erosion, salinity, pollution, and loss of organic carbon.
 - The conference underscored the importance of international cooperation in tackling soil erosion, which aligns with **Sustainable Development Goal 15 (SDG 15) of the United Nations**.
 - SDG 15 aims to protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests sustainably, combat desertification, halt land degradation, and halt biodiversity loss.

Note:

- The ISSS was established in 1934, in Calcutta under the **Societies Registration Act xxi of 1860**. The Society organises seminars, and conferences to promote soil science knowledge.
- IUSS is a non-profit, non-governmental scientific society. It is part of the **International Science Council (ISC)**.
 - The IUSS promotes soil science research and its applications, fostering global collaboration among scientists.

What are the Concerns Regarding Soil Health in India?

- **Soil Degradation:** **Over one-third** of India's land is at risk of **degradation** due to unsustainable farming practices and **wrong soil management practices**.
- **Soil Erosion and Loss of Fertility:** **India loses 15.35 tonnes of soil per hectare annually**, reducing crop productivity and causing a **loss of 13.4 million tonnes of rainfed crops**.
 - This leads to significant economic losses, along with increased **floods, droughts**, and a 1-2% annual reduction in reservoir capacity.
- **Soil salinity:** Salinity harms soil health by **reducing water infiltration, nutrient uptake, and soil aeration**, leading to decreased crop productivity.
 - It disrupts soil structure, promotes salt-tolerant organisms, and accelerates soil degradation, ultimately making the land infertile.
- **Low Organic Content and Nutrient Levels:** A major concern is the **organic content in the Indian soil is inordinately low (around 0.54%)**, indicating a deficiency in essential nutrients, which affects soil fertility and agricultural productivity.

Note:



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- Over 70% of Indian soils suffer from either **soil acidity or alkalinity**, which disrupts the natural nutrient cycle.
- Additionally, essential nutrients like nitrogen, phosphorus, and potassium are often deficient in Indian soils, further exacerbating the **health crisis**.
- **Desertification:** It leads to soil **degradation by reducing organic matter**, nutrient content, and moisture retention. It results in the loss of soil fertility, causing lower agricultural productivity.
 - Desertification accelerates erosion, reduces biodiversity, and makes land unsuitable for farming, worsening food insecurity.
- **Diversion of Fertile Land:** A significant amount of fertile agricultural **land is being diverted for non-agricultural purposes**, contributing to the loss of valuable soil resources.

India's Initiatives for Soil Conservation:

- [Soil Health Card \(SHC\) Scheme](#)
- [Pradhan Mantri Krishi Sinchai Yojana.](#)
- [Zero Budget Natural Farming](#)
- [Natural Farming Mission.](#)

What are the Key Facts About Soil in India?

- **Classification of Soils:** India's varied relief features, landforms, climatic realms, and vegetation types have contributed to the development of various types of soils.
 - Historically, Indian soils were classified into two main groups: **Urvara (fertile) and Usara (sterile)**.
 - The **Soil Survey of India**, established in 1956, and the [National Bureau of Soil Survey and Land Use Planning](#) have classified Indian soils based on the **United States Department of Agriculture (USDA) Soil Taxonomy**, considering genesis, colour, composition, and location.
- **Major Soil Types in India:**

Soil Type	Distribution	Characteristics	Main Crops Grown
Alluvial Soils	Northern plains, river valleys, deltas of the east coast, and plains of Gujarat	Vary from sandy loam to clay; rich in potash, poor in phosphorus; Khadar (new alluvium) and Bhanger(older alluvium); colour ranges from light grey to ash grey	Rice, wheat, sugarcane, cotton
Black Soil	Deccan Plateau (Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh, Tamil Nadu)	Clayey, deep, impermeable; swells and becomes sticky when wet, shrinks and develops cracks when dry; retains moisture for long periods; rich in lime, iron, magnesia, alumina, and potash; poor in phosphorus, nitrogen, and humus	Cotton, sorghum, pulses, millets
Red and Yellow Soil	Eastern and southern Deccan Plateau, parts of Odisha, Chhattisgarh, southern Ganga plain	Develops on crystalline igneous rocks; red due to iron diffusion, yellow when hydrated; fine-grained soils are fertile, coarse-grained soils in uplands are less fertile; poor in nitrogen, phosphorus, and humus	Wheat, rice, millets, pulses, groundnut

Note:

Laterite Soil	High temperature and rainfall areas (Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, Odisha, Assam)	Result of intense leaching; rich in iron oxide and potash, poor in organic matter, nitrogen, phosphate, and calcium	Cashew, tea, coffee, rubber, coconut
Arid Soil	Western Rajasthan, Punjab and Haryana	Sandy and saline; poor in moisture and humus; high evaporation and calcium content create 'kankar' layers; poor nitrogen, normal phosphate; colour ranges from red to brown	Barley, cotton, millet, pulses
Saline Soil	Western Gujarat, eastern coastal deltas, Sunderbans (West Bengal), areas with excessive irrigation (Punjab, Haryana)	High in sodium, potassium, and magnesium; infertile; saline due to dry climate and poor drainage; poor nitrogen and calcium; salt crust formation due to capillary action in irrigated areas	Rice, wheat, barley (with gypsum treatment)
Peaty Soil	Areas with heavy rainfall and high humidity (Northern Bihar, southern Uttarakhand, coastal West Bengal, Odisha, Tamil Nadu)	High organic matter and humus content; heavy and black; can be alkaline; organic matter up to 40-50%; found in waterlogged and swampy areas	Rice, jute
Forest Soil	Forested areas with sufficient rainfall, Himalayas, Western and Eastern Ghats	Varies in structure and texture; loamy and silty in valleys, coarse-grained in upper slopes; acidic and low in humus in snow-bound areas; fertile in lower valleys	Tea, coffee, spices, tropical fruits

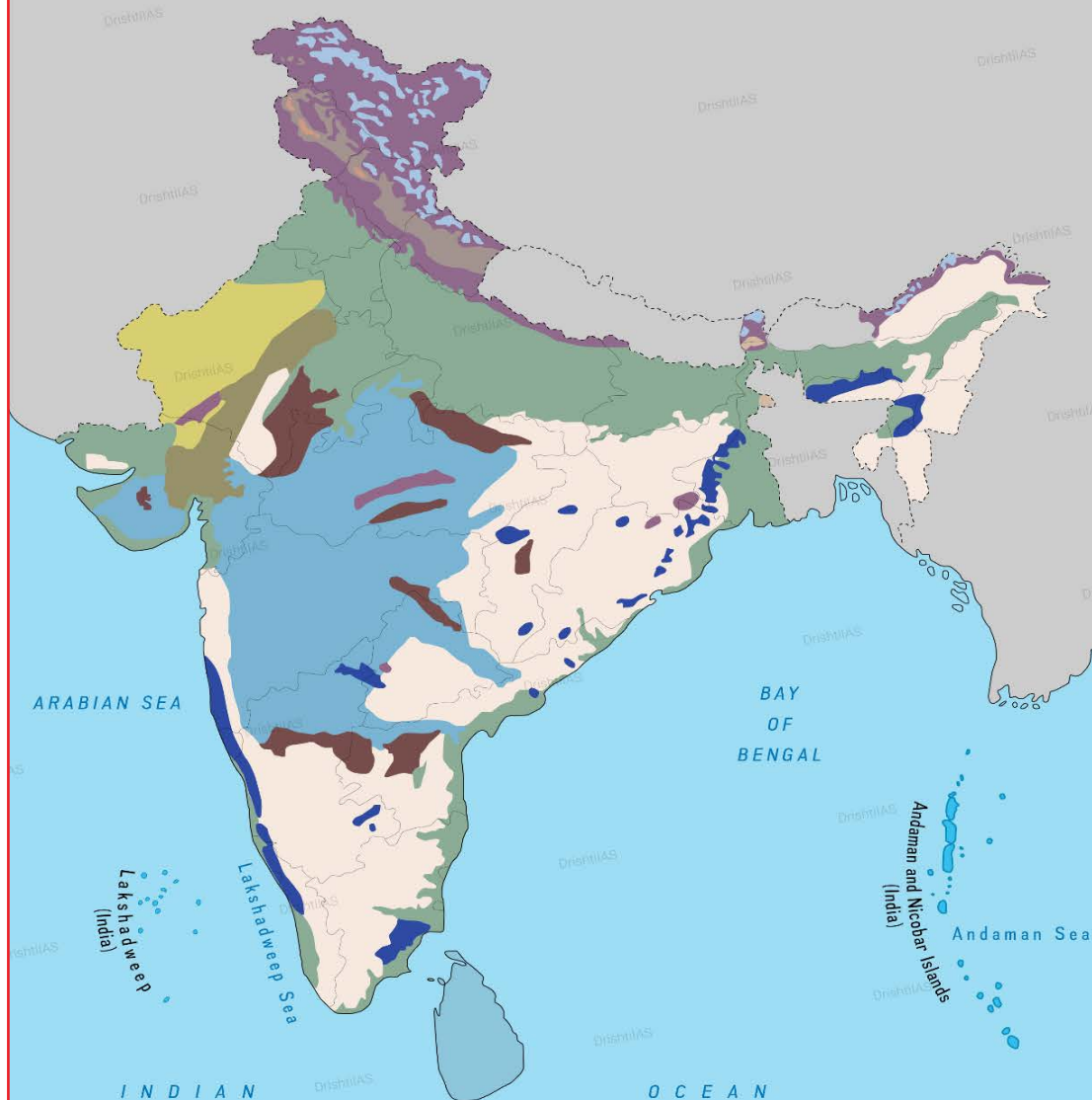
Soil Profile

- **About:** A soil profile is a vertical cross-section of soil, showing different layers (horizons) that vary in texture, colour, and chemical composition.
 - Soil Horizons developed through interactions of climate, organisms, and land surface can be **organic (O)** or **mineral (A, E, B, C)**.
- **Key Layers of Soil:**
 - **O Horizon (Organic Layer):** Contains undecomposed organic matter like leaves, twigs, and moss.
 - **A Horizon (Topsoil):** Rich in organic matter and minerals, supports plant growth, soft and porous.
 - **E Horizon (Eluviated Layer):** A lighter, nutrient-depleted layer due to leaching (removal of minerals by water).
 - **B Horizon (Subsoil):** Accumulates leached minerals from upper layers; contains iron, clay, and organic compounds.
 - **C Horizon (Parent Rock):** Made up of broken bedrock or saprolite, with little organic matter.
 - **R Horizon (Bedrock):** Unweathered bedrock at the base of the soil profile.

Note:

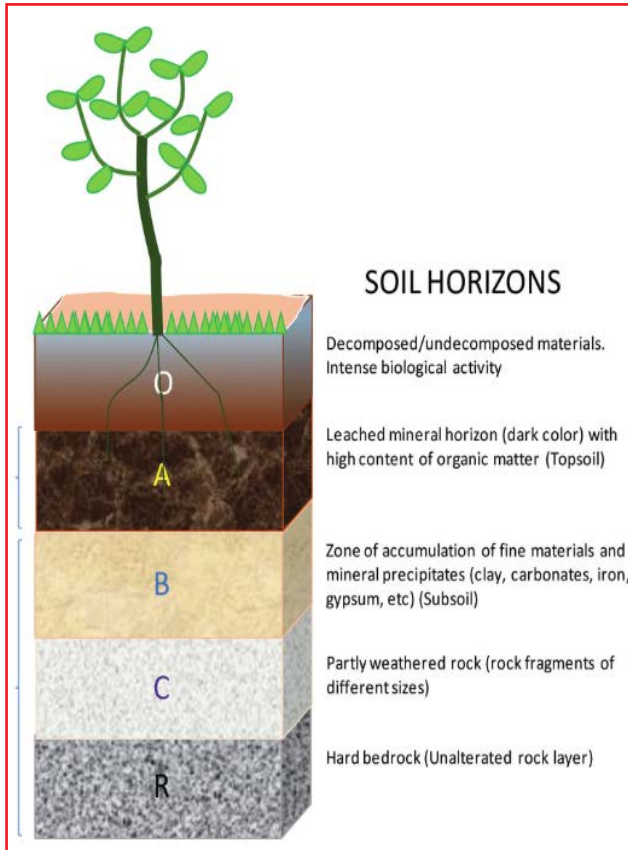


Types of Soil in India



	Alluvial Soil (29.55%)	In the Upper and Middle Ganga plain, two different types of alluvial soils have developed, viz. Khadar and Bhangar.			
	Black Soil (19.62%)	It is also known as 'Regur Soil' or the 'Black Cotton Soil'.			
	Red Soil (19.62%)	The soil develops a reddish colour due to a wide diffusion of iron in crystalline and metamorphic rocks. It looks yellow when it occurs in a hydrated form.			
	Desert Soil (14.02%)	They are generally sandy in structure and saline in nature.			
	Laterite Soil (4.77%)	Laterites are not suitable for cultivation. Thus, are widely cut as bricks for use in house construction.			
	Mountain Soil	It is also known as 'Forest Soil'. They are loamy and silty on valley sides and coarse-grained in the upper slopes.			
	Snowfields	This soil is found under the snow and glaciers at the highest peak of the greater Himalayas, Karakoram, Ladakh, and Zaskar.			
	Grey and Brown Soil		Submontane Soil		Red and Black Soil

Note:



What Can Be Done to Enhance Soil Health?

- **Policy:** Develop more comprehensive schemes like the SHC, which provides farmers with **detailed information about the nutrient status of their soil**. This helps in making informed decisions about fertiliser use and soil management.
- **Carbon Sequestration:** Soil **carbon sequestration** boosts soil health by storing **atmospheric carbon dioxide (CO₂)** as organic carbon, improving fertility and water retention. Practices like cover cropping and reduced tillage enhance carbon levels and sustainability.
- **Sustainable Farming Practices:** India can adopt **large-scale no-till farming**, as successfully implemented in **Brazil**, to improve **soil health**, **reduce erosion**, and boost crop yields.
 - This sustainable practice ensures better productivity and environmental conservation.
 - Sustainable Farming practices like crop rotation, **agroforestry** and organic farming are vital for soil health and environmental conservation.

Global Decline in Freshwater Reserves

Why in News?

Recent data from **National Aeronautics and Space Administration (NASA)**- German GRACE (Gravity Recovery and Climate Experiment) satellites reveal a significant **decline in Earth's total freshwater levels** since 2014.

Note: The GRACE is a joint mission by NASA and Germany, its goal is to measure Earth's **gravity field**, using two identical satellites that orbit Earth about 220 km apart. These satellites track **gravitational changes** due to various geophysical processes like **ocean currents**, **groundwater storage**, **ice sheet dynamics**, and solid Earth movements such as **earthquakes**.

What is the Status of Decline in Freshwater Reserves?

- **Global:** Between 2015 and 2023, freshwater stored on land, including lakes, rivers, and groundwater, **fell by 1,200 cubic kilometres**.
 - Half of the world's countries have **degraded freshwater systems**, with over **400 river basins** experiencing declining water flows, including iconic watersheds like the **Congo Basin**.
 - The **World Meteorological Organization** reports that **2023 marked the driest year in over three decades** for rivers globally, exacerbating the freshwater crisis.
- **India:** Home to **18% of the global population**, India has just **4% of the world's freshwater resources** and occupies only **2.4% of Earth's surface**. Nearly half of its **rivers are polluted**, and over **150 primary reservoirs are at just 38% of their storage capacity**, exacerbating the country's severe water crisis.
 - The 2018 Composite Water Management Index by **NITI Aayog (National Institution for Transforming India)** indicates that a significant portion of India's population faces high to extreme water stress, with approximately **600 million Indians experiencing water scarcity**.
 - **Groundwater depletion** is a major concern, especially in **agrarian states** like Punjab and Haryana, where **overexploitation for irrigation and domestic use** has caused water tables to drop significantly.

Note:



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- Areas in central and western India, including Rajasthan, Maharashtra, and Gujarat, are frequently hit by **droughts**, further depleting already strained water reserves.

Water on the Earth's surface

Reservoir	Volume (Million Cubic km)	Percentage of the Total
Oceans	1,370	97.25
Ice Caps and Glaciers	29	2.05
Groundwater	9.5	0.68
Lakes	0.125	0.01
Soil Moisture	0.065	0.005
Atmosphere	0.013	0.001
Streams and Rivers	0.0017	0.0001
Biosphere	0.0006	0.00004

Water covers about 71% of the earth's surface. 97% of the earth's water is found in the oceans (too salty for drinking, growing crops, and most industrial uses except cooling). 3% of the earth's water is fresh.

What are the Causes for the Decline in Freshwater Levels?

- **Role of El Niño Events:** The **2014-2016 El Niño event**, one of the most significant since 1950, disrupted rainfall patterns globally.
 - **Warmer Pacific Ocean temperatures** shifted atmospheric jet streams, intensifying drought conditions worldwide.
- **Effects of Climate Change:** Climate change has caused **irregular and uneven rainfall patterns**, resulting in **prolonged dry spells**, droughts, and erratic monsoon seasons.
 - Intense precipitation events caused **surface runoff** instead of **groundwater replenishment**. Prolonged dry periods compact soil, reducing its **water absorption capacity**.
 - Climate change **amplifies evaporation** and increases **atmospheric water-holding capacity**, worsening drought conditions.
 - Droughts have significantly affected regions such as Brazil, Australasia, North America, Europe, and Africa.

- **Over-extraction of Groundwater:** Over-reliance on groundwater for irrigation, particularly in areas with inadequate rainfall, has led to its depletion, **as extraction often exceeds natural replenishment**.
 - Additionally, industries and urban centres that depend on groundwater further exacerbate the depletion.
- **Loss of Ecosystems:** Destruction of natural ecosystems, such as **wetlands** and forests, **reduces the ability of the land to retain water**.
 - The loss of forest cover leads to **soil erosion**, which reduces the ability of the land to absorb rainwater, further decreasing the replenishment of water bodies.
- **Agricultural Practices and Pollution:** Agriculture consumes **70% of the world's accessible freshwater**, but inefficient irrigation methods and the cultivation of water-intensive crops lead to **significant water waste**.
 - **Industrial waste and untreated wastewater** also contribute to the pollution of water bodies, with long-term impacts on water quality and availability.

What are the Implications of Freshwater Decline?

- **Impact on Biodiversity:** The **World Wildlife Fund (WWF)** reports an **84% decline in freshwater species since 1970**, driven by habitat loss, pollution, and migration barriers like dams.
 - These factors destabilise ecosystems, threatening biodiversity and their essential services.
- **Impact on Human Communities:** The **2024 UN report on water stress** highlights that reduced water availability strains farmers and communities, leading to **famine, conflicts, poverty, and a higher risk of waterborne diseases**.
 - Water scarcity also hampers industries, affecting economic development and job creation. By 2025, **1.8 billion people may experience "absolute water scarcity,"** a crisis worsened by **rapid population growth**, inefficient water use, and poor governance.
 - **Urban areas are not immune to water stress.** Many cities in India including Chennai, and Bengaluru, have faced severe water shortages in recent years, disrupting daily life and leading to **increased costs for water transportation and management**.

Note:



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- **Ecosystem Services:** Freshwater ecosystems **support nutrient cycling**, boosting agricultural productivity. Wetlands also help **mitigate flooding and enhance climate resilience**.
 - Their degradation threatens these vital services, reducing both environmental and community stability.
- **Geopolitical Conflicts:** Over **60% of global freshwater is shared by two or more countries**. The decline in these resources, whether due to droughts, over-extraction, or pollution, can lead to **disputes over water rights and usage**.
 - Water scarcity can worsen political tensions, as seen in the **Nile River dispute between Egypt, Sudan, and Ethiopia**.
 - Ethiopia's construction of the Grand Ethiopian Renaissance Dam has raised concerns in Egypt over its water supply, potentially escalating into broader conflicts.
 - Similarly, in **India, disputes over river water sharing**, such as those involving the **Indus Water Treaty (IWT) with Pakistan** and the inter-state conflicts over the **Cauvery** and **Krishna rivers**, have led to ongoing conflicts between states.
- **Science and Technology:** The decline in freshwater resources impacts **Artificial Intelligence (AI)** systems, which **rely on water for cooling data centres**.

- By 2027, AI is estimated to consume **4.2 to 6.6 billion cubic metres of water annually**, increasing pressure on already limited water supplies.

What are the Initiatives Related to Water Conservation?

- **Global:**
 - [World Water Day](#)
 - [Water Credit](#)
 - **Water Action Agenda:** Launched at the **United Nations 2023 Water Conference**, includes over 830 voluntary commitments from the global water community to fast-track progress towards **Sustainable Development Goal 6 (ensuring universal access to water and sanitation by 2030)**.
- **India:**
 - [National Water Policy \(2012\)](#)
 - [Atal Bhujal Yojana](#)
 - [Jal Shakti Abhiyan](#)
 - [Pradhan Mantri Krishi Sinchai Yojana](#)
 - [Mission Amrit Sarovar](#)
 - [National Aquifer Mapping \(NAQUIM\)](#)
 - **Bhu-Neer Portal:** It aims to improve groundwater regulation across India. It provides a centralised platform for accessing information on groundwater laws, regulations, and sustainable practices.



Note:

Security

Highlights

- Rising Digital Arrests
- 16th Anniversary of 26/11 Attacks
- Anti-Personnel Landmines Convention

Rising Digital Arrests

Why in News?

Digital arrests are the newest form of **cyber scam** that has affected more than **92,000 Indians** in 2024 in which **money is extracted** through online transfers under the guise of **resolving tax or legal dues**.

What are Key Facts About Digital Arrest?

- **About:** Digital arrest scams involve cybercriminals **impersonating law enforcement officials or government agencies** such as the State police, **CBI**, **ED**, and **Narcotics Bureau** defrauding gullible victims of their hard-earned money.
 - Scammers call **unsuspecting people**, claiming a case has been filed against them and even use a **fake police station** to give credence to their allegations.
- **Modus Operandi:** Cybercriminals contact victims by **phone or email**, starting with **audio calls and then video calls** from places like airports, police stations, or courts.
 - They use photos of **police officers, lawyers, and judges** as display pictures on their social media accounts to appear legitimate.
 - They may also send **fake arrest warrants, legal notices, or official-looking documents** via email or messaging apps.
- **Trapping Victims:** The cybercriminals typically accuse victims of serious crimes such as **money laundering, drug trafficking, or cybercrime**.
 - They may **fabricate evidence** to make their accusations seem credible.
- **Vulnerability of People:**
 - **Fear and Panic:** Fear of arrest threats push victims to comply **without rational thought**.

- **Lack of Knowledge:** Unfamiliarity with law enforcement procedures makes it difficult for victims to distinguish legitimate claims from fraud.
- **Social Stigma:** Fear of **social stigma** and impact on family motivates victims to comply to avoid embarrassment.
- **Manipulative Techniques:** Use of **AI voices, professional logos, and simulated video calls** to appear credible and increase victim compliance.
- **Isolation and Control:** Scammers isolate victims by preventing them from seeking verification, making it easier to control them.
- **Increased Target Vulnerability:** **Trusting, less tech-savvy, or stressed individuals** are prime targets for easier deception.

What is the Status of Cyber Scams in India?

- **Overview:** According to the **Indian Cyber Crime Coordination Centre (I4C)**, cyber scams in India have shown a significant rise in both **frequency and financial impact**.
 - This alarming trend indicates a **persistent and evolving** threat landscape in India's digital ecosystem.
- **Complaints and Losses:** The number of complaints increased significantly over the years, with **1,35,242 complaints in 2021, 5,14,741 in 2022, and 11,31,221 in 2023**.
 - The total **monetary loss** from cyber frauds has reached **Rs 27,914 crore** between **2021 and September 2024**.
- **Major Scams:**
 - **Stock Trading Scams:** It is the most significant source of loss with **Rs 4,636 crore** from **2,28,094** complaints.

Note:

- Under it, scammers offer **unrealistic returns** trading stocks, foreign currencies, or cryptocurrencies but victims end up being **defrauded**.
- **Ponzi Scheme Scam**: Caused **Rs 3,216 crore** in losses with **1,00,360** complaints.
- **“Digital Arrest” Frauds**: Accounted for **Rs 1,616 crore** in losses from **63,481** complaints.
- **New Money Siphoning off Tactics**: Cybercriminals have adapted their strategies to siphon off money.
- **Withdrawal Methods**: Stolen money is often withdrawn through various channels, including **cheques**, **CBDC**, fintech **cryptocurrencies**, **ATMs**, **merchant payments**, and **e-wallets**.
- **Mule Accounts**: The I4C has identified and frozen around **4.5 lakh mule bank accounts**, used primarily for laundering funds from cybercrime.

Indian Cyber Crime Coordination Centre (I4C)

- **About**: I4C was launched by the **Ministry of Home Affairs in 2020** to deal with all types of **cyber crimes** including **cyber fraud** in a comprehensive and coordinated manner.
- **Objectives of I4C**:
 - To act as a **nodal point** to curb **Cybercrime** in the country.
 - To **strengthen the fight** against Cybercrime committed against **women and children**.
 - Facilitate **easy filing Cybercrime related complaints** and identifying Cybercrime trends and patterns.
 - To act as an **early warning system for Law Enforcement Agencies** for proactive Cybercrime prevention and detection.
 - **Awareness creation** among the public about preventing Cybercrime.
 - Assist States/UTs in **capacity building of Police Officers**, Public Prosecutors and Judicial Officers in the area of cyber forensic, investigation, cyber hygiene, cyber-criminology, etc

➤ National Cyber Crime Reporting Portal:

- Under I4C, the **National Cyber Crime Reporting Portal** is a **citizen-centric initiative** which will enable citizens to **report cyber fraud online** and all the complaints will be accessed by the concerned law enforcement agencies for taking action as per law.

What are Challenges in Addressing Cyber Scams?

- **Anonymity and Privacy**: Cybercriminals use tools such as **virtual private networks (VPNs)** and **encrypted messaging apps** to **conceal their identity and location**, complicating efforts to trace and arrest them.
- **International Scope**: Cyber scams often span **multiple countries**, making it difficult for local law enforcement to take action.
 - A significant portion of scams originates from **Southeast Asia and China**.
- **Rapidly Evolving Tactics**: Phishing scams have advanced from simple emails to more sophisticated tactics, including **social engineering**, **text messages**, and **voice calls**, making fraud harder to detect.
- **Advanced Malware**: Cyber scams use advanced malware that can **bypass antivirus programs and firewalls** to steal data or gain unauthorized access.
- **Regulatory Fragmentation**: Different countries have different regulations, making it difficult to create cohesive international strategies for combating cybercrime.
 - Also, countries **lack comprehensive threat intelligence** to identify emerging cyber scam trends and tactics **without sharing data**.
- **Growing Digital Market**: The growth of **e-commerce** and **digital payment systems** has led to an increase in scams such as **fake online stores**, **card skimming**, and **fraudulent payment schemes**.

Types of Cyber Scams

- **Phishing Scams**: Fraudsters **send fake emails or messages** that mimic trusted organizations to trick victims into sharing sensitive information like **passwords or financial details**.

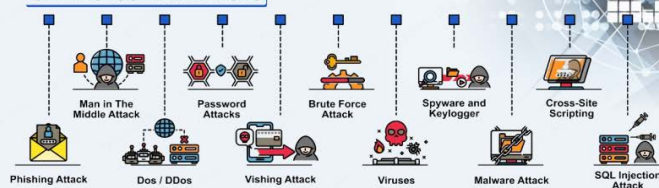
Note:

- **Lottery and Prize Scams:** Victims receive notifications claiming they have won a **significant prize** and are asked to pay a **processing fee or taxes** to claim it.
- **Emotional Manipulation Scams:** Scammers on **dating apps** build relationships with victims and later ask for money for emergencies, often demanding payments in **cryptocurrency**.
- **Job Scams:** Scammers post **fake job listings** on hiring platforms or social media to trick job seekers, especially fresh graduates, into giving **personal information or money**.
- **Investment Scams:** These scams appeal to a **victim's desire for quick money** by promising high, unrealistic returns through **Ponzi or pyramid schemes**.
- **Cash-on-Delivery (CoD) Scams:** Scammers set up **fake online stores** that accept CoD orders. When the product is delivered, it is either **counterfeit or not as advertised**.
- **Fake Charity Appeal Scams:** Scammers create **fake websites or social media pages** for bogus causes like **disaster relief or health initiatives**, using emotional stories or images to create **urgency and sympathy**.
- **Mistaken Money-Transfer Scams:** Scammers contact victims claiming money was **mistakenly sent** to their account and using fake transaction receipts to pressure them into returning it to avoid **legal trouble**.
- **Credit Card Scams:** Fraudsters offer loans at **low interest rates** with quick approval. After the victim pays an **upfront fee** to secure the loan, the scammers disappear.

CYBER SECURITY

Cybersecurity refers to any technology, measure, or practice for preventing cyberattacks or mitigating their impact.

CYBER SECURITY ATTACKS



'Crime in India' Report 2022 (NCRB) highlighted 24.4% surge in cybercrimes in India since 2021.

Common Cybersecurity Myths

- ❌ Strong passwords alone are adequate protection
- ❌ Major cybersecurity risks are well-known
- ❌ All cyberattack vectors are contained
- ❌ Cybercriminals don't attack small businesses

Cyber Warfare

- ❌ Digital attacks to disrupt vital computer systems, to inflict damage, death, and destruction.

CYBER THREAT ACTORS

CYBER THREAT ACTOR	MOTIVATION
NATION-STATES	GEOPOLITICAL
CYBERCRIMINALS	PROFIT
HACKTIVISTS	IDEOLOGICAL
TERRORIST GROUPS	IDEOLOGICAL VIOLENCE
THRILL-SEEKERS	SATISFACTION
INSIDER THREATS	DISCONTENT

Types of Cybersecurity

- ❌ Critical infrastructure security (Robust access controls)
- ❌ Network security (Deploying firewalls)
- ❌ Application security (Code reviews)
- ❌ Cloud Security (Tokenization)
- ❌ Information security (Data masking)

Recent Major Cyber Attacks

- ❌ WannaCry Ransomware Attack (2017)
- ❌ Cambridge Analytica Data Breach (2018)
- ❌ Financial data of 9M+ cardholders, including SBI, leaked (2022)

Regulations & Initiatives

- ❌ **International:**
 - ❌ UN Group of Governmental Experts (GGE) on Advancing Responsible State Behaviour in Cyberspace
 - ❌ NATO's Cooperative Cyber Defense Centre of Excellence (CCDCOE)
 - ❌ Budapest Convention on Cybercrime, 2001 (India not a signatory)
- ❌ **India:**
 - ❌ IT Act, 2000 (Sections 43, 66, 66B, 66C, 66D)
 - ❌ National Cyber Security Policy, 2013
 - ❌ National Cyber Security Strategy 2020
 - ❌ Cyber Surakshit Bharat Initiative
 - ❌ Indian Cyber Crime Coordination Centre (I4C)
 - ❌ Computer Emergency Response Team-India (CERT-In)

Steps Needed for Cyber Security

- ❌ Network Security
- ❌ Malware Protection
- ❌ Incident Management
- ❌ User Education and Awareness
- ❌ Secure Configuration
- ❌ Managing User Privileges
- ❌ Information Risk Management Regime



What are the Key Government Initiatives Related to Cyber Scam in India?

- **National Cyber Security Policy**
- **Computer Emergency Response Team - India (CERT-In)**
- **Cyber Surakshit Bharat Initiative**
- **Cyber Swachhta Kendra**
- **National Critical Information Infrastructure Protection Centre (NCIIPC)**
- **Digital Personal Data Protection Act, 2023**
- **Cyber Crime Coordination Centre**
- **Citizen Financial Cyber Fraud Reporting and Management System**

16th Anniversary of 26/11 Attacks

Why in News?

On 26th November 2008, Lashkar-e-Taiba, a Pakistan-based terror group, carried out attacks at the **Taj Mahal Palace Hotel, Nariman House, Oberoi Trident, and Chhatrapati Shivaji Railway Station** in Mumbai.

Note:

- The attacks revealed significant **vulnerabilities** in India's **security infrastructure**, prompting urgent reforms in **counter-terrorism measures**.

What were Indian Security Vulnerabilities Exposed by 26/11 Attacks?

- **Intelligence Failures:** The failure to **share intelligence in real-time** between various security agencies allowed the terrorists to **operate undetected** for a significant period before the attack.
- **Maritime Security:**
 - **Porous Coastal Borders:** The attackers hijacked an **Indian fishing trawler** after traveling on a Pakistani-flagged cargo ship, then used **inflatable boats** to land on Indian shores without raising suspicion.
 - **Lack of Coordination:** The **lack of clear command and control** structures among **Indian Navy, Coast Guard, Marine Police** led to inefficiencies in securing the **coastal areas**, making them vulnerable to exploitation.
- **Digital Vulnerabilities:** India's inability to counter **digital propaganda** and **online radicalisation** led to **local support** through **logistical assistance**.
- **Lack of Specialised Training:** India's security forces were **not adequately trained** to handle the new type of **urban terror attack** with multiple sites targeted simultaneously as seen in **26/11**.
- **Slow Response:** The **delayed response** from security forces, combined with a lack of **rapid deployment and tactical coordination**, allowed the terrorists to hold out for several hours.
- **Inadequate Cyber Security Measures:** The 26/11 attackers used advanced communication tools, including **satellite phones**, to stay in constant contact with their handlers in Pakistan.

What Steps Were Taken to Strengthen Security after 26/11 Attacks?

- **Maritime Security Revamp:** The Indian Navy was made responsible for **overall maritime security**, while the **Indian Coast Guard** managed **territorial waters** and coordinated with **new marine police stations** along the coastline.
 - The Indian Navy established the **Sagar Prahari Bal** to enhance **coastal patrolling** and rapid response capabilities.
 - Regular **coastal security exercises** are conducted across all states, in collaboration with the **Coast**

Guard, State and Central Government agencies for improving coordination.

- All vessels longer than **20 meters** were made to install the **Automatic Identification System (AIS)** to transmit **identification** and other critical information.
- **Intelligence Coordination:** The **Intelligence Bureau's Multi-Agency Centre (MAC)** was strengthened to improve the **coordination of intelligence sharing** among central agencies, the armed forces, and state police.
 - MAC's charter was **expanded** to cover new areas, such as **analysing and addressing radicalisation** and terrorism networks more effectively.
- **Institutional Measures:**
 - **National Counter-Terrorism Centre (NCTC)** was established to **draw up plans and coordinate action** for counter-terrorism with other stake holders including anti-terrorist organisations in states.
 - **Crime and Criminal Tracking Network and Systems (CCTNS)** was started to **inter-link all police stations** under a common application software for the purpose of **investigation, data analytics, research, and policy making**.
 - **National Intelligence Grid (NATGRID)** is an integrated IT platform to help access data gathered from various databases such as **credit and debit cards, tax, telecom, immigration, airlines and railway tickets, passports, driving licenses** among others to tackle crime and terror threats in the country.
- **Legal Reforms:** The **Unlawful Activities Prevention Act, 1967 (UAPA)** was amended to broaden the definition of **terrorism** to take more proactive steps against terrorist activities.
 - The **National Investigation Agency (NIA) Act, 2008** was passed to create a **federal investigation agency** with the authority to handle terrorism cases **across states**.
- **Modernisation of Police Forces:** The Ministry of Home Affairs allocated more funds to state governments to **upgrade police stations, equip them with modern technology, train officers** for modern challenges like terrorism, and provide better weapons.
 - Emphasis was given to the creation of **crack commando** teams among all police forces.
 - The **National Security Guard (NSG)** established four regional hubs across the country at **Chennai**,

Note:



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Hyderabad, Kolkata and Mumbai for rapid deployment.

- **International Cooperation:** The biggest impact of the 26/11 attacks was the **willingness of the West, especially the US**, to cooperate with India on matters of security.
 - The US provided **real-time information** during the attacks and helped gather **prosecutable evidence** through the FBI that helped **isolate Pakistan globally**.
 - In **2018**, global pressure led to **Pakistan** being placed on the **FATF** grey list, forcing action against terror groups like **Lashkar-e-Taiba (LeT)** and **Jaish-e-Muhammad (JeM)**.
- **Sensitisation Campaigns:** These drives aim to sensitise **local populations** about the risks posed by **maritime threats** and to encourage them to report **suspicious activities**.

What are the Persistent Lacunas in Indian Coastal Security?

- **Challenge of Monitoring:** India's **7517 km-long coastline**, including the mainland (5423 km) and the Andaman & Nicobar Islands (2094 km).
 - The vast coastline, with thousands of fishing boats and dhows, makes **monitoring and patrolling potential threats** challenging.
- **Lack of Comprehensive Coverage:** The provision to install **Automatic Identification Systems (AIS)** for boats over 20 meters in length, limits the scope of maritime surveillance, especially when many **smaller boats (under 20 meters)** could be used for illegal activities such as **smuggling or infiltration**.
- **Diverse Threat Landscape:** The varied nature of threats (**Terror Attacks, Smuggling, and Illegal Migration**) highlights the complexity of the security challenges.
 - Migrants, particularly from **Bangladesh and Sri Lanka**, may pose security risks, either **inadvertently or deliberately**.
- **Over-reliance on Local Communities:** Fishermen are crucial for **coastal security**, but relying solely on them for intelligence is risky due to potential non-cooperation from fear, lack of awareness, or distrust.
- **Poor Infrastructure:** State police forces continue to remain **ill-equipped and poorly trained** with continued political interference hampering overall coordination.

Anti-Personnel Landmines Convention

Why in News?

Recently, the **United States** has approved sending **anti-personnel landmines** to Ukraine which are banned under the **Anti-Personnel Landmines Convention, 1997**.

- In another development, the US has supplied the **Army Tactical Missile System (ATACMS)** to Ukraine which can **hit targets inside Russian territory**.

What is Anti-Personnel Landmines Convention, 1997?

- **About:** It is an international agreement that aims to eliminate the **use, production, stockpiling, and transfer** of anti-personnel landmines.
 - It is commonly referred to as the **Ottawa Convention or Anti-Personnel Mine Ban Treaty**.
- **Adoption:** It was concluded by the Diplomatic Conference on an International Total Ban on Anti-Personnel LandMines at **Oslo** on **18th September 1997** and entered into force on **1st March 1999**.
- **Scope:** It prohibits anti-personnel mines but does **not cover anti-vehicle mines**.
- **Membership:** The Convention is **signed by 133 States**. Today it has **164 States parties**.
 - The **US, Russia and India** are **not** party to the convention. **Ukraine** is a **signatory**.

Anti-Personnel Landmines

- Landmines are **explosives** that are **concealed** on the ground and are designed to **detonate** when **enemy forces pass over or near them**.
- **Anti-personnel mines** are built to **hurt enemy troops** while **anti-tank mines** are built to **destroy armoured vehicles**.

Note: ATACMS is a **surface-to-surface ballistic missile** designed to strike targets at a range of **up to 300 km**. It is powered by **solid rocket propellant** and follows a **ballistic trajectory**.

- Ballistic trajectories are used to describe the paths of projectiles like **missiles or artillery shells** that are launched and then fall to their targets due to **gravity**.



Note:

Rapid Fire Current Affairs

Highlights

- Eklavya Platform
- Jim Corbett National Park
- Revised Dividend Guidelines for CPSEs
- Centre for Processing Accelerated Corporate Exit (C-PACE)
- Excavation Pit Collapsed in Lothal
- Grievance Redressal Assessment and Index (GRAI) 2023
- Dark Tourism
- Red Sea
- CCI Imposes Fine on Meta
- High-Altitude Sickness
- Optical Fibre in Siachen
- Siddi Community
- Samos Island
- Norway Apologizes for Historical Assimilation Policies
- Hearing Abilities of Minke Whales
- One Nation One Subscription
- Ban on ULFA Under UAPA
- SC Upheld Socialist and Secular Values in Preamble
- SC Quashes Telangana Land Allotment to Privileged Groups
- Ophiophagus Kaalinga
- National Gopal Ratna Award 2024
- Consanguinity Marriage and Inbreeding
- Guru Tegh Bahadur Ji's Martyrdom Day
- Viksit Bharat Young Leaders Dialogue
- Bacteria to Solve Math Problems
- National Dolphin Research Centre
- Bandipur Tiger Reserve
- Bhu-Neer Portal
- Science of Plant Communication
- Rare White Peacock
- Salt Chimneys in the Dead Sea
- WAVES OTT Platform of Prasar Bharati
- Guided Pinaka Weapon System
- Indigenous Antibiotic Nafithromycin
- Sacred Relics of Saint Francis Xavier
- India's Tea Industry
- India's 10-Year Coffee Growth Plan
- Tropical Rainforests can Survive Global Warming
- Sanyukt Vimochan 2024
- Aphantasia
- India's Satellite Launch by SpaceX
- Bharat National Cyber Security Exercise 2024
- World Toilet Day
- Tuna Export Hub in Andaman & Nicobar Islands
- Grand Commander of the Order of the Niger (GCON) Award
- Long Range Land Attack Cruise Missile
- Nepal-Bangladesh Power Transfer via India
- Barak River
- 1st Bodoland Mohotsav
- 58th Meeting of National Mission for Clean Ganga
- Job for Deceased Staffers' Kin
- Europe's Digital Euro
- Wayanad Landslides and Disaster Status

Eklavya Platform

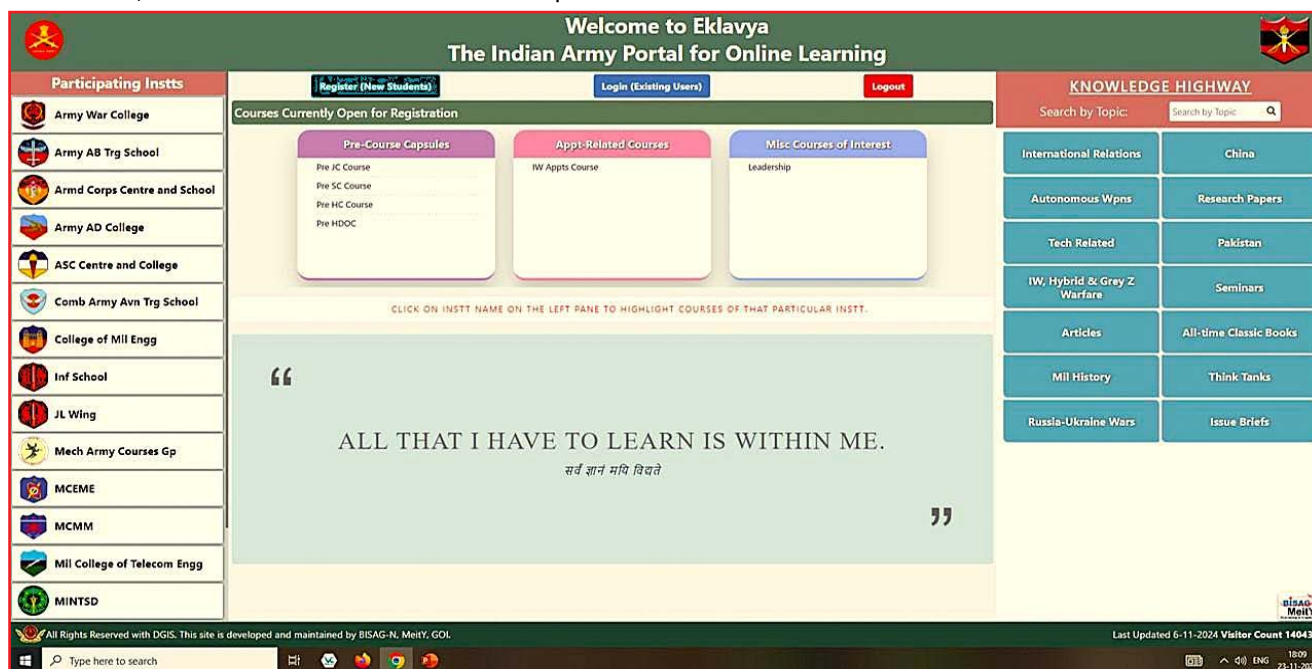
Recently, the **Ministry of Defence** launched **Eklavya**, an online learning platform for the Indian Army.

- **Aim:** To improve the **professional education and training** of Indian Army officers under the **Decade of Transformation (2023-2032)** initiative and the 2024 theme, **Year of Technology Absorption**.

- **Developed By:** Bhaskaracharya National Institute of Space Applications and Geoinformatics (**BISAG-N**), **Gandhinagar**.
- **Content:** A total of **96 courses by 17 Category 'A' Training Establishments** of the Indian Army have been hosted on the platform.
- Three Categories of Courses:
 - **Pre-course Preparatory Capsules:** Shift basic **offline** physical courses to the **online courses**.

Note:

- **Appointment/Assignment Related Courses:** Like information warfare, defence land management, financial planning, discipline and vigilance works etc.
- **Professional Development Suite:** Courses on **Strategy, Operational Art**, Leadership, Organisational Behaviour, **Emerging Technology** etc.
- **Centralised Knowledge Hub:** Eklavya features a searchable “**Knowledge Highway**” where **journals, research papers, articles**, and more are accessible under one platform.



Read More: [Technological Penetration in Indian Army](#)

Jim Corbett National Park

The **Supreme Court (SC) of India** stressed balancing **wildlife conservation** with local community needs, while addressing the issue of private buses operating through the **core and buffer zones** of **Jim Corbett National Park, Uttarakhand**.

- The SC was hearing a petition challenging the Jim Corbett National Park's **2020 decision** allowing private buses within the core area, which had been stayed since 2021.
 - **Section 38(O) of the Wildlife Protection Act, 1972** states that **tiger reserves** cannot be diverted for ecologically unsustainable uses.
 - If such diversion is necessary, the state of Uttarakhand must obtain approval from the **National Board for Wildlife** on the advice of the **National Tiger Conservation Authority**.
 - The diversion of protected areas must adhere to strict guidelines to safeguard ecosystems from long-term harm.
- Jim Corbett National Park, located in **Nainital district, Uttarakhand**, is part of the **Corbett Tiger Reserve**.
 - It was established in 1936 as **Hailey National Park** to protect the **Bengal tiger**, it is the oldest national park in India and the **first area under the Project Tiger initiative in 1973**.
- The **core zone** is a **strictly protected area** for natural resources, while the **buffer zone surrounds it**, allowing for sustainable nature conservation alongside compatible human activities.

Read more: [Corbett Tiger Reserve: Uttarakhand](#)

Note:

Revised Dividend Guidelines for CPSEs

Recently, the **Department of Investment and Public Asset Management (DIPAM)** has introduced revised guidelines for **Central Public Sector Enterprises (CPSEs)**, mandating a **minimum annual dividend payment of 30% of profit after tax (PAT) or 4% of net worth**, whichever is higher.

- Earlier, the **2016 guidelines** stipulated that dividend payments must be **30% of profit after tax (PAT) or 5% of net worth**, whichever is greater.
 - The guidelines also extend to CPSE subsidiaries where the parent central public sector enterprise holds **over 51% stake**.
- The guidelines allow CPSEs whose market price has been below book value for six months, with a net worth of **at least Rs 3,000 crore**, to consider **share buybacks**. Additionally, they can issue **bonus shares** when reserves exceed 20 times their paid-up equity.
 - **Share Buybacks** is the reacquisition by a company of its own shares from the stock market.
 - **Bonus shares** are additional shares granted to existing shareholders at no extra cost, based on the quantity of shares they currently hold.
- **DIPAM** manages Central Government investments, including disinvestment and equity sales in Central Public Sector Undertakings.

Read more: **Department of Public Enterprises**

Centre for Processing Accelerated Corporate Exit (C-PACE)

The **Centre for Processing Accelerated Corporate Exit (C-PACE)** has efficiently streamlined the process of company closures to **70-90 days**.

- It aims to expedite the **voluntary winding up** of companies within **six months**.
 - Since **5th August 2024**, C-PACE has been empowered processing eForms related to striking off **Limited Liability Partnerships (LLPs)** as well.

- C-PACE was launched by the **Ministry of Corporate Affairs (MCA)** to **centralise and streamline** the process of company closure.
 - It functions under the **Registrar of Companies (RoC)**, an office under MCA.
- It facilitates '**Ease of Doing Business**' by eliminating the necessity for **physical interactions** with stakeholders.
- **Section 248** of the **Companies Act, 2013** gives RoC the authority to remove a company's name from the **register of companies**.
 - **Voluntary liquidation** under **Section 59 of the IBC** is now more streamlined as it does not require **NCLT** intervention to start the process.
- The timeline for voluntary winding up of companies takes between **90 and 180 days in the US** while in **Germany** it takes **more than a year**.

Read More: **Corporate Governance**

Excavation Pit Collapsed in Lothal

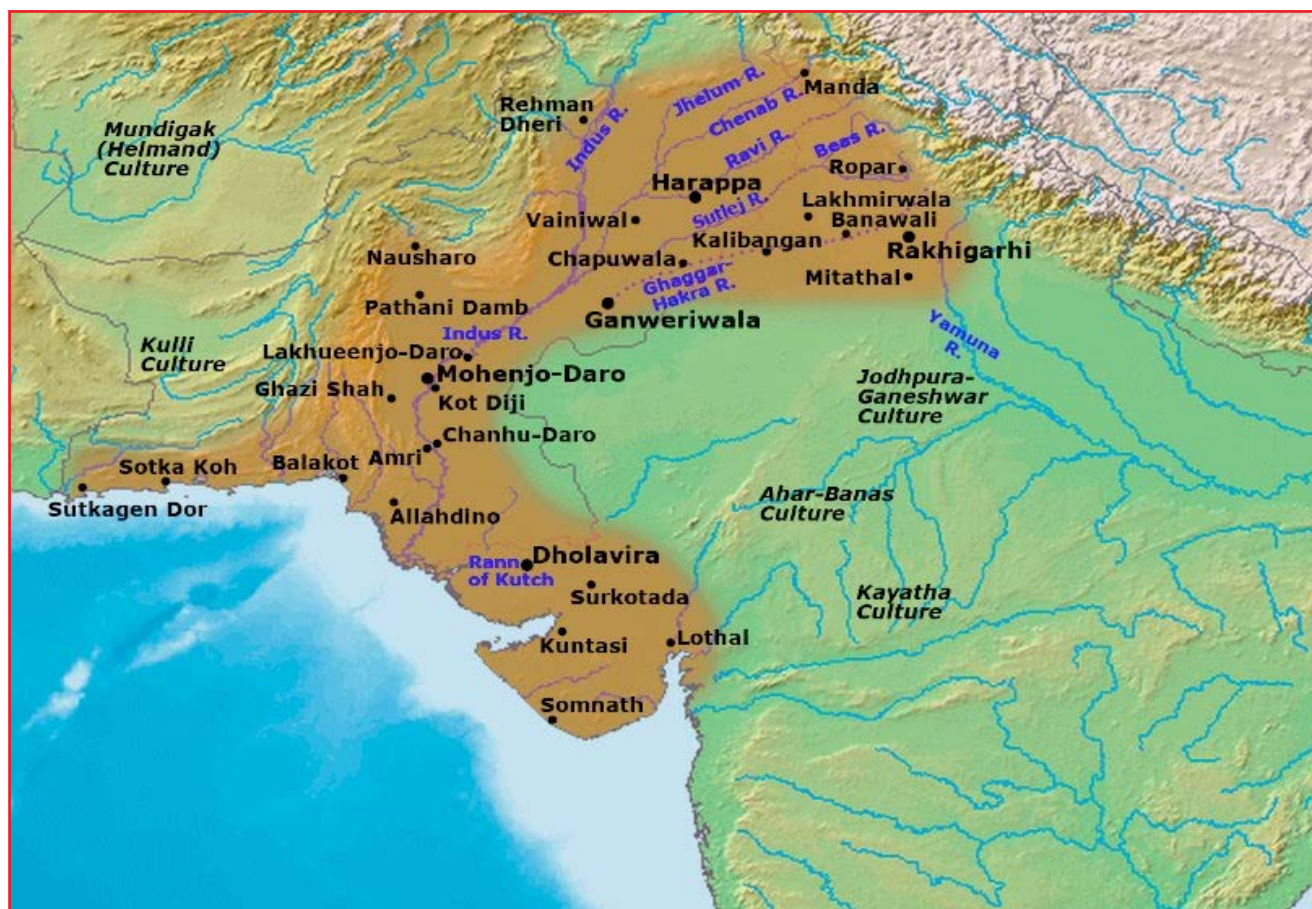
Recently, a research scholar died when a **pit collapsed** on her during a **research excavation** at **Lothal**, a Harappan site.

- **About Lothal:** Located in the **Bhal region of Gujarat**, Lothal is one of the **southernmost sites** of the **Harappan civilization**.
 - It is believed to have been built in **2200 BC**.
 - It was discovered in **1954** by **SR Rao**.
 - The meaning of Lothal in Gujarati is "**the mound of the dead**". (**Mohenjodaro** also means the same in Sindhi).
 - It had the **world's earliest known dock**, connecting the city to an ancient course of the **Sabarmati river**.
 - It is the **only port-town** of the Harappan Civilisation.
 - Lothal was nominated in April 2014 as a **UNESCO World Heritage Site**.
 - A **National Maritime Heritage Complex (NMHC)** is being developed at **Lothal**.
- **Surkotada** and **Dholavira** are other important **Harappan sites** in Gujarat.

Note:



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Read More: [Lothal: World's Earliest Known Dock](#)

Grievance Redressal Assessment and Index (GRAI) 2023

Recently, the [Ministry of Personnel, Public Grievances and Pensions \(MoPP&P\)](#), launched the [GRAI 2023](#). This initiative aims to evaluate and improve the grievance redressal mechanisms of various central ministries and departments in India.

- The GRAI was conceptualised by the [Department of Administrative Reforms and Public Grievances \(DARPG\)](#) based on recommendations from the Parliamentary Standing Committee of the [MoPP&P](#).
- The [GRAI index](#), based on **four dimensions** (Efficiency, Feedback, Domain, Organizational Commitment) and 11 indicators, assesses 89 central ministries and departments, enabling comparative analysis of grievance handling.

- The data used for this assessment was collected from the [Centralized Public Grievance Redressal and Management System \(CPGRAMS\)](#), ensuring a standardised evaluation process.
 - [CPGRAMS](#) is an online platform available to citizens **24/7** to lodge their **grievances to the public authorities** on any subject related to service delivery.
 - Recognised as a best practice by the [Commonwealth Secretariat](#), CPGRAMS serves as a vital tool for citizens to file and track grievances, enhancing transparency in public service.
- The report indicates that 85 out of 89 ministries showed an improvement in their GRAI scores compared to the previous year.
 - Approximately 10% of the ministries/departments achieved over **50% growth**, while **28% recorded growth between 25-50%.**

Read more: [Speedy Grievances Redressal under CPGRAMS](#)

Note:



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Dark Tourism

The war in **Ukraine** has sparked the rise of “**dark tourism**,” where visitors travel to conflict zones to witness the aftermath of war and its effects on local communities. This type of tourism, also known as **thanatourism or grief tourism**, involves visiting sites tied to death and tragedy.

- Ukrainian officials and residents have mixed reactions, viewing it as either a source of income or “**blood money**.”
- **Dark Tourism India:**
 - **Kuldhara Village, Jaisalmer:** An abandoned village with numerous myths and eerie(strange and frightening) stories, now a historical site managed by the **Archaeological Survey of India**.
 - **Cellular Jail, Port Blair (Kala Pani):** A colonial-era prison where freedom fighters endured severe torture; now a **national museum** showcasing India’s dark history under British rule.
 - **Roopkund Lake, Uttarakhand (Skeleton Lake):** A mysterious lake with skeletal remains of hundreds, whose origins remain unsolved.
 - **Lothal, Gujarat:** A significant site of the **Indus Valley Civilization**. **Lothal** is an ancient city offering a glimpse into one of the oldest urban settlements in the world.

- **Dumas Beach, Surat:** Known for its haunted reputation and eerie folklore, attracts paranormal enthusiasts.

Read more: [Tourism in India](#)

Red Sea

Seventeen foreign tourists are missing after a **yacht capsized in the Red Sea off the coast of Egypt**, amid warnings of turbulent sea conditions.

- The **Red Sea** is a major hub for international tourism, known for its diving spots and vibrant marine life.
- **Red Sea:** It is an inlet of the **Indian Ocean** between **Africa and Asia**.
 - An inlet is a narrow strip of water that goes from a sea or lake into the land or between islands
- **Bordering Countries:** Egypt, Saudi Arabia, Yemen, Sudan, Eritrea and Djibouti.
 - Red Sea, connected to the Indian Ocean in the south through the **Bab el Mandeb strait and the Gulf of Aden**.
 - The northern Red Sea features the Sinai Peninsula, the Gulf of Aqaba, and the Gulf of Suez, which leads to the **Suez Canal**.
- It occupies a part of the **Great Rift Valley** (Afro-Arabian Rift Valley).



Read more: [Escalating Threat in Red Sea](#)

Note:

CCI Imposes Fine on Meta

Recently, the [Competition Commission of India \(CCI\)](#) imposed a penalty of Rs 213.14 crore on Meta for abusing its dominant position through [WhatsApp's 2021 privacy policy](#) update.

- This ruling **prohibits WhatsApp from sharing user data with other Meta companies** for advertising purposes and mandates that user consent must be obtained for any data sharing.
 - The CCI found that WhatsApp's 2021 policy update **forced users to accept expanded data collection terms without an option to opt out**, constituting an unfair condition under the [Competition Act](#).
 - The new policy may enable commercial exploitation and political micro-targeting.
 - The ruling mandates WhatsApp to provide clear explanations regarding data-sharing practices, enhancing transparency for users.
- WhatsApp's policy also conflicts with the [Srikrishna Committee report](#), which forms the basis of the [Data Protection Bill 2019](#), including **data localisation** and **limiting data use to its original purpose**.
- The [Competition Commission of India \(CCI\)](#) is a **statutory body** responsible for enforcing the [Competition Act of 2002](#).

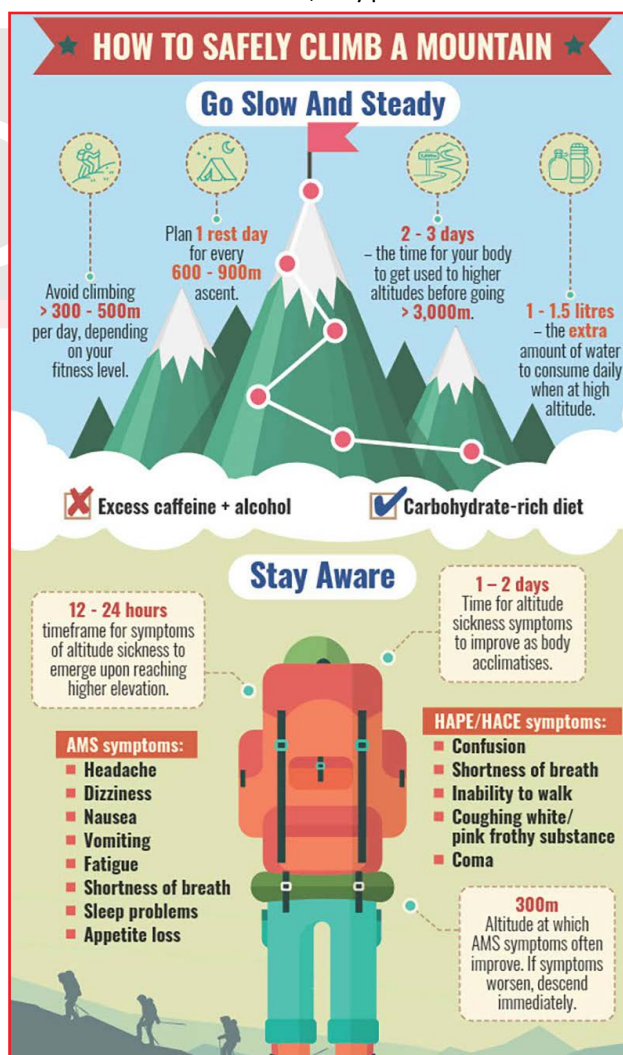
Read more: [Whatsapp and Violation of Privacy](#)

High-Altitude Sickness

The recent death of a trekker from Kerala due to **high-altitude sickness (HAS)** or **Acute Mountain Sickness (AMS)** while attempting to scale a **peak in Uttarakhand** has brought attention to the dangers of trekking in the mountains.

- Popular trekking routes often exceed 3,000 meters, increasing the risk of **AMS** among unacclimatised trekkers.
- **High-altitude sickness** occurs when individuals ascend rapidly to elevations **above 2,400 meters**, without adequate acclimatisation.
 - As altitude rises, both air pressure and oxygen levels drop, causing hypoxia, which is a shortage of oxygen in the body's tissues.
 - **Symptoms** include headaches, nausea, fatigue, and shortness of breath.

- Severe cases of HAS/AMS can lead to **High Altitude Pulmonary Edema (HAPE)** and **High Altitude Cerebral Edema (HACE)**, both life-threatening conditions requiring immediate descent.
 - At high altitudes, the body adapts by increasing breathing (**can cause hyperventilation**) and producing more red blood cells, thickening the blood and straining the heart.
 - **HAPE causes lung fluid buildup**, and worsening breathing, while **HACE leads to confusion, hallucinations, and coma**.
- **Treatment Strategies:**
 - Supplemental oxygen or a portable hyperbaric chamber can help alleviate symptoms of **AMS** and **HACE** in emergencies.
 - Pharmacological treatments, such as **acetazolamide** and **dexamethasone**, may provide short-term relief.



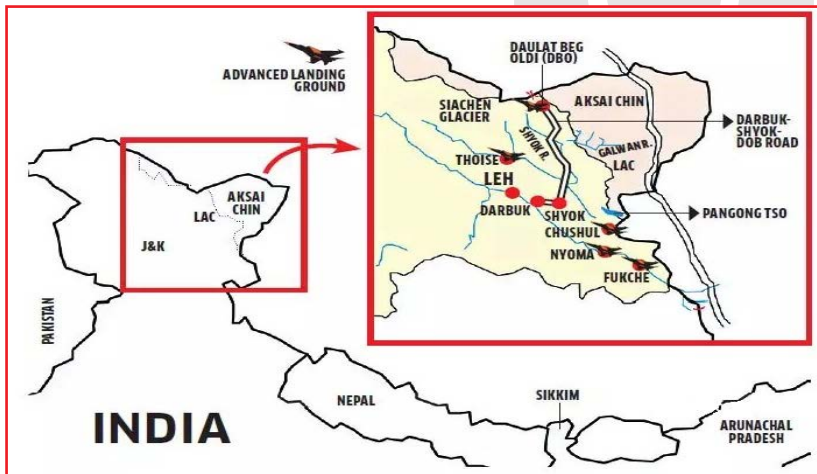
Readmore: [High Altitude Pathogens](#)

Note:

Optical Fibre in Siachen

For the very **first time**, the Indian Army has successfully installed **Optical fibre connectivity** at **Siachen** and **Daulat Beg Oldie (DBO)** to ensure **high-speed broadband connectivity**.

- **Fiber optic cables** use fast-traveling pulses of light to transfer digital information. It relies on **total internal reflection** for their operation.
- **Siachen** is the **world's highest and coldest** battlefield. It is strategically located between **Pakistan on the left and China on the right**.
 - It is situated to the **North of Nubra Valley** through which **Nubra river** flows.
 - The **Nubra River** originates from the Siachen Glacier and is a tributary of the **Shyok River**, which is part of the **Indus River system**.
 - Additionally, Siachen glacier provides a view of the **Nubra valley in the Karakoram ranges**.
 - **Siachen** has been under Indian control since 1984, when the Indian Army launched **Operation Meghdoot** and occupied the glacier on the **Saltoro ridge** before it fell into Pakistani hands.
- **DBO** is an **Indian military base**, located at the **Northernmost tip** of India in the **Karakoram mountains**.



Read More: [Siachen Glacier](#)

Siddi Community

Recently released film *Rhythm of Dammam* highlights the **marginalised Siddi community** in India.

- **Origin:** They are descendants of **African slaves** brought by the **Portuguese** in the late **17th century** during the **trans-Indian Ocean slave trade**.
 - They exhibit **Negroid physical traits**.
 - They are also known by different synonyms such as **Habshi** and **Badsha**.

- **Present-Day Location:** They mainly reside along the **western coast** of India, particularly in the states of **Gujarat, Maharashtra, and Karnataka**.
- **ST Status:** In India, the Union government in **2003**, classified Siddis under the list of **Scheduled Tribes**.
 - They are also included in the Centre's list of **Particularly Vulnerable Tribal Groups**.
- **Family System:** The community follows a **nuclear family system**, although extended families exist.
- **Cultural Expression:** The Siddis are known for their **folk music and dances**, such as **Dhamal** and **Rasda**, with **men** performing the **Dhamal dance**.

Read More: [Tribes in India](#)

Samos Island

A shipwreck near the **Greek island of Samos** led to the deaths of eight migrants, highlighting the ongoing challenges of **irregular migration** in the region.

- **Samos and nearby Aegean islands** are key transit points for migrants entering the **European Union** illegally from Turkey. Over 54,000 migrants have entered Greece illegally in 2024.
 - Many face dangerous journeys in unsafe, overcrowded boats, including riskier **Mediterranean** routes from Libya.
- The Island of Samos is in Greece, located on the **Eastern Aegean Sea** just 1,700 meters from the Asia Minor Turkish Coast.
 - Asia Minor or Anatolia is the westernmost part of Asia, which makes up the majority of modern-day Turkey.
- Samos Island is home to the fortified ancient city (Pythagoreion) and

Note:



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ancient Temple of Hera (Heraion) of Samos, a **UNESCO Heritage Site**. It is also the birthplace of **Pythagoras** (Greek philosopher and mathematician).



Read more: [Greek Island of Lesbos](#)

Norway Apologizes for Historical Assimilation Policies

Norway's Parliament issued an official apology for the century-long **assimilation policies**, known as "**Norwegianisation**," that discriminated against the **Sami**, **Kven**, and **Forest Finn** communities.

- Assimilation Policy promotes integrating diverse groups into the dominant culture, often requiring them to **adopt its norms, values, and language**, sometimes **losing their own cultural identity**.
- The **Norwegianisation process** aimed to erase the cultures and languages of the Sami, Kven, and Forest Finns.
 - Indigenous children were taken from their families and sent to state-run schools, where they faced discrimination and forced cultural change.
- **Sami**: Indigenous people from northern Europe, primarily in Norway, Sweden, Finland, and Russia,

are the speakers of the **Sami languages**, which are endangered.

- **Kvens and Forest Finns**: Migrants from Finland and Sweden who settled in Norway centuries ago, with distinct cultural practices.

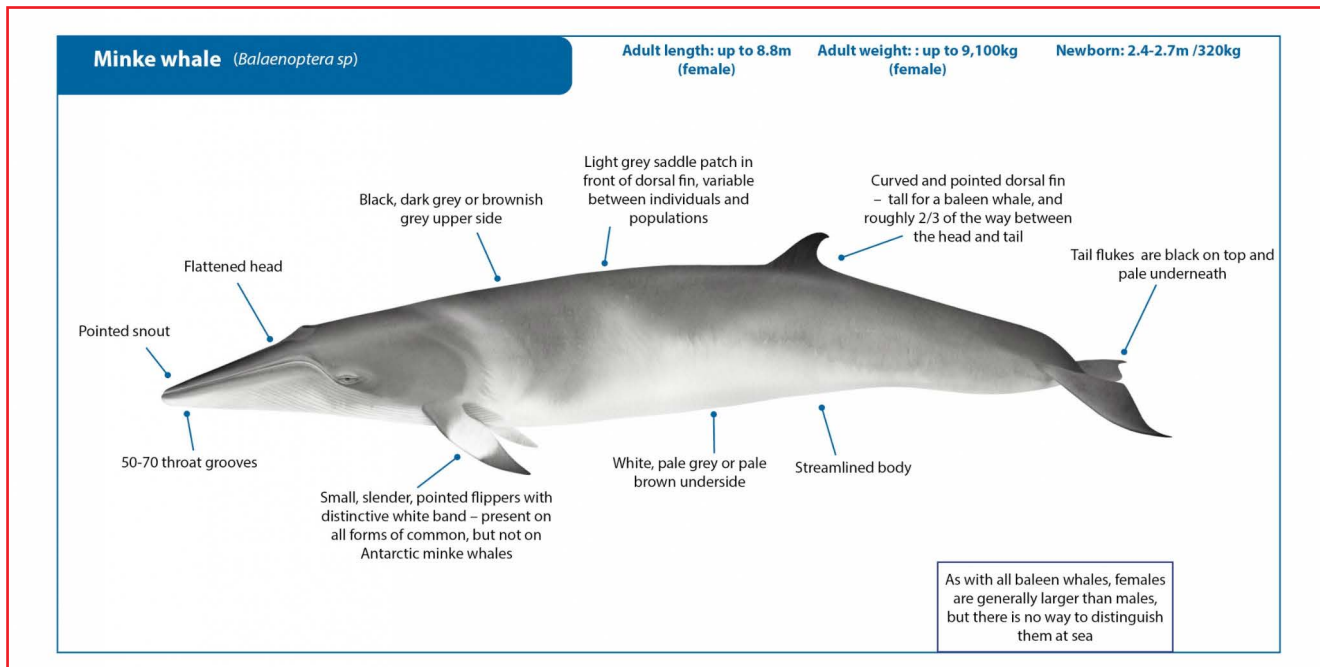
Read more: [Tribal Development Approaches](#)

Hearing Abilities of Minke Whales

Recent research has revealed that **minke whales** can detect high-frequency sounds up to **90 kilohertz (kHz)**, a significant finding that enhances our understanding of these marine mammals.

- The study reveals minke whales are more affected by ocean noise pollution than previously thought, with shipping, naval sonar, and industrial activities increasing marine noise levels.
- Anthropogenic noise can interfere with marine mammals' communication, foraging behaviour, and navigation abilities.
- **Current regulations may insufficiently protect baleen whales**, as their hearing ranges were previously underestimated. This new data calls for a reevaluation of marine noise pollution policies.
- **Minke Whales: Minke Whales (*Balaenoptera acutorostrata*)** are the **smallest member of the rorqual whale family**, which includes other **baleen whales**. It can reach a maximum length of about **10.7 meters**.
- **Conservation status:**
 - **Common minke whale:**
 - **IUCN**: Least concern
 - **CMS**: Appendix II
 - **CITES**: Appendix I (threatened with extinction)
 - **Antarctic minke whale:**
 - **IUCN**: Data Deficient
 - **CMS**: Appendix II

Note:



Read more: [Fin Whale](#)

One Nation One Subscription

Recently, the Union Cabinet has approved the **One Nation One Subscription (ONOS)** scheme, for **three years** to provide nationwide access to scholarly **research articles and journals**.

- ONOS scheme will be coordinated by the **Information and Library Network (INFLIBNET)**, which is an **autonomous inter-university center** under the [University Grants Commission \(UGC\)](#).
- Traditional academic publishing relies on a **'pay to read' model**, where libraries and institutes pay fees to access published research.
- ONOS aims to **democratise access to high-quality academics** for students and researchers across India, particularly benefiting those in **tier-2 and tier-3 cities**.
- ONOS will provide access to over **13,000 high-impact journals** from **30 leading international publishers**, significantly improving the availability of academic resources for students and researchers.
 - The initiative targets over 6,300 institutions, benefiting around 1.8 crore students, faculty, and researchers, and enhances access to international journals, boosting India's visibility in global research communities.

➤ Other Initiatives Related to R&D:

- [Anusandhan National Research Foundation \(ANRF\) Act, 2023](#)
- [Vigyan Dhara scheme](#)
- [National Research Foundation \(NRF\)](#)

Read more: [Concerns Related to Scientific Publishing](#)

Ban on ULFA Under UAPA

Recently, the Ministry of Home Affairs (MHA) extended the ban on the **United Liberation Front of Asom (ULFA)** for five more years under the **Unlawful Activities Prevention Act, 1967 (UAPA)**.

- ULFA is an **armed militant organisation** operating in **Assam** that aims to **secede Assam** from India.
 - ULFA was formed in **1979** to seek the **"restoration of Assam's sovereignty"** through **armed struggle**.
 - ULFA was first banned in **1990** and the ban has been renewed periodically, with the last extension in **2019**.
- **Section 35** of the UAPA, 1967 empowers the government to declare an **organisation as unlawful or an individual as terrorist** if it engages in activities promoting **terrorism or secession**.

Read More: [Assessing the Unlawful Activities Prevention Act](#)

Note:



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SC Upheld Socialist and Secular Values in Preamble

Recently, the **Supreme Court** upheld the addition of **socialist and secular** to the **Preamble** inserted through the **42nd Amendment Act, 1976**.

- Under **Article 368**, Parliament can amend the Constitution, including the **Preamble**, and the **1976 additions** were valid despite the **26th November 1949 cut-off date**.
- The **Right to Freedom of Religion** (Articles 25 - 28) provides the right and liberty to **preach, practice and propagate** the religion of his choice.
- **Secularism** was upheld as India's unique interpretation, where the state respects all religions equally, referencing the **SR Bommai Case, 1994**.
 - **Articles 14, 15, and 16** of the Constitution **prohibit discrimination** against citizens on **religious grounds** while guaranteeing equal protection of laws and equal opportunity in public employment.
 - **Article 44** permits the govt to strive for a **Uniform Civil Code (UCC)** and it is not restricted by the term **Secular** in the Preamble.
- **Socialism** practised in India aims to achieve the goal of **economic and social upliftment** of citizens.
 - It does not restrict **private entrepreneurship** and the right to do business, which is guaranteed as a fundamental right under **Article 19(1)(g)**.

Read More: [Socialist and Secular as Integral Part of Constitution](#)

SC Quashes Telangana Land Allotment to Privileged Groups

The **Supreme Court(SC) of India** has quashed the **Telangana government's land allotments** to cooperative societies comprising **Members of Parliament (MPs), Member of the Legislative Assembly (MLA), civil servants, and journalists**, deeming it a **violation of equality under Article 14 of the Constitution**.

- The SC criticized the land allotment to privileged groups at **discounted rates**, favoring the already privileged over **marginalized communities**.

- The court warned that such allocation of scarce land resources leads to **inequality** and has broader economic implications in **densely populated urban areas**.
- The ruling termed the policy a **colourable exercise of power**, benefiting policymakers and their peers while **misusing public resources** under the guise of **aiding "deserving sections."**
 - A of power refers to actions taken by a **legislative body** that seem to be within their authority but **actually violate constitutional limits** or principles
- The SC reminded the government that the **State holds resources in trust for citizens**, and its actions should aim for the **public good** rather than benefiting select groups.

Read more: [Fundamental Rights \(Part-1\)](#)

Ophiophagus Kaalinga

Recently, Karnataka's **king cobra** species, known locally as '**Kaalinga Sarpa**,' is officially named **Ophiophagus Kaalinga** in the scientific community.

- **King cobras** were **first classified in 1836** as **Ophiophagus hannah** by Danish naturalist **Theodore Edward Cantor**.
 - **King cobras underwent no genetic studies for 186 years until recently.**
- The king cobra has been reclassified into **four distinct species** based on geographical lineages:
 - **Northern King Cobra (Ophiophagus hannah)**: Found from Pakistan to eastern China and Southeast Asia.
 - **Sunda King Cobra (Ophiophagus bungarus)**: Inhabits Southeast Asia, including Thailand, Malaysia, and parts of the Philippines.
 - **Western Ghats King Cobra (Ophiophagus kaalinga)**: Endemic to India's **Western Ghats**.
 - **Luzon King Cobra (Ophiophagus salvatana)**: Found only on **Luzon Island, Philippines**.
- King cobras are **diurnal (active during the day)**, feeding primarily on snakes like rat snakes, dhamans, and other cobras.
- The king cobra is the only snake that **builds and guards a nest** until the eggs hatch.
- Its venom is used in developing **pain relievers** like **Cobroxin and Nyloxin**.

Read More: [Snake Venom Neutralising Antibody](#)

Note:



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National Gopal Ratna Award 2024

Recently, the [Department of Animal Husbandry and Dairying \(DAHD\)](#) announced the winners of the [National Gopal Ratna Awards \(NGRA\) 2024](#) under the [Rashtriya Gokul Mission](#) (RGM).

- It is one of the highest honours in the livestock and dairy sector and is presented on [National Milk Day](#) (26th November 2024).
- **Award Categories:**
 - Best dairy farmer rearing [indigenous cattle/buffalo breeds](#),
 - Best [Artificial Insemination](#) Technician (AIT)
 - Best dairy cooperative/ milk producer company/ dairy farmer producer organisation.
 - **Special Awards for the North Eastern Region (NER)** were introduced in 2024.
- RGM was launched in **2014** to conserve and develop indigenous breeds under the **National Programme for Bovine Breeding and Dairy Development (NPBBDD)**.
- **NPBBDD have Two Components:**
 - **National Programme for Bovine Breeding (NPBB):** Conservation and development of recognized indigenous breeds.
 - **National Programme for Dairy Development (NPDD):** Creating infrastructure related to production, procurement, processing and marketing by milk unions/federations.

Read More: [Rashtriya Gokul Mission](#)

Consanguinity Marriage and Inbreeding

In **Uppada coast** villages in Andhra Pradesh, [consanguineous marriages](#) are causing conditions like [cerebral palsy](#), **Dandy-Walker Malformation (DWM)**, [albinism](#), and other deformities.

- A consanguineous marriage is a **union** between two people who are **related by blood**, usually as **second cousins or closer**.
 - It is different from incestuous marriages (a marriage between **direct descendants** like between father and daughter, mother and son, brother and sister).

- Practices like the '**Voni**' promise, an **oral agreement** made at a girl's birth, enforce consanguinity in the above case.
- **Inbreeding** is the **genetic outcome** of consanguineous marriage. Inbreeding increases the degree of **homozygosity** to the **offspring** and also the expression of **recessive traits**.
 - **In homozygosity**, an individual inherits the **same alleles** for a particular gene from both parents leading to **genetic disorders**.
 - **Alleles** are **different versions of the same gene**.
E.g., the gene for eye colour may have alleles for **blue, brown, or green eyes**.
- Inbreeding increases the **genetic load**. Genetic load measures the **rate of damage** caused by the presence of certain **deleterious or disadvantaged genes** in the population.
- The [Hindu Marriage Act](#) prohibits Sapindas marriage between **two Hindus** unless there is an **established custom**.
 - A **sapinda marriage** involves individuals who share a **specific degree of familial closeness**.

Read More: [Rare Disease Day 2024](#)

Guru Tegh Bahadur Ji's Martyrdom Day

The President of India on the eve of [Guru Tegh Bahadur Ji's Martyrdom Day](#) (24th November), paid homage to the [Sikh](#) Guru, emphasizing his sacrifice for humanity and religious freedom.

- **Early Life:** Born in Amritsar in 1621, Guru Tegh Bahadur was initially known as **Tyag Mal** for his ascetic nature. Trained in religious philosophy and martial skills, he earned the **title "Tegh Bahadur"** for his **valor in battle**.
- **Contributions as a Guru:** Ascended as the **9th Sikh Guru in 1664**, succeeding **Guru Har Krishan**. Established **Anandpur Sahib in 1665** and contributed over 700 hymns to the **Guru Granth Sahib**, focusing on equality, justice, and devotion.
- **Advocate of Religious Freedom:** Opposed forced conversions during **Aurangzeb's** reign and encouraged **fearlessness (nirbhau) and harmony (nirvair)** among his followers.

Note:



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- **Martyrdom:** November 24 is observed as **Shaheedi Divas in honor of Guru Tegh Bahadur**, who was executed by Aurangzeb in 1675 for defending **Kashmiri Pandits** and **resisting forced conversions to Islam**. His companions, **Bhai Mati Das, Bhai Sati Das, and Bhai Dyala, were also martyred.** .
 - Gurdwara Sis Ganj Sahib in Delhi's Chandni Chowk marks the site of his execution.

Ten Gurus of Sikh Religion	
Guru Nanak Dev (1469-1539)	<ul style="list-style-type: none"> ➤ He was the first guru of Sikh and the founder of Sikh religion. ➤ He started the GURU KA LANGAR. ➤ He was the contemporary of Babur. ➤ Kartarpur corridor was commemorated on the 550th birth anniversary of Guru Nanak Dev.
Guru Angad (1504-1552)	<ul style="list-style-type: none"> ➤ He invented the new script called Guru-Mukhi and popularized and expanded the system of Guru ka Langar.
Guru Amar Das (1479-1574)	<ul style="list-style-type: none"> ➤ He introduced the ceremony of the Anand Karaj Marriage. ➤ He abolished the custom of Sati and Purdah system among the Sikhs. ➤ He was a contemporary of Akbar.
Guru Ram Das (1534-1581)	<ul style="list-style-type: none"> ➤ He founded Amritsar in 1577 on the land granted by Akbar. ➤ He started the construction of Golden Temple/Swarna mandir at Amritsar.
Guru Arjun Dev (1563-1606)	<ul style="list-style-type: none"> ➤ He composed the Adi Granth in 1604. ➤ He led to the completion of construction of Golden temple. ➤ He was acclaimed as Shaheeden-de-Sartaj. ➤ He was executed by Jahangir on charges of helping prince Khusrau.
Guru Hargobind (1594-1644)	<ul style="list-style-type: none"> ➤ He led to the transformation of the Sikh Community into a Military community. He is known as "Soldier Saint". ➤ He led to the establishment of Akal Takht and fortified the Amritsar City. ➤ He waged wars against Jahangir and Shah Jahan.
Guru Har Rai (1630-1661)	<ul style="list-style-type: none"> ➤ He was a man of peace thus devoted most of his life in maintaining peace with Aurangzeb and doing missionary work.
Guru Har Krishan (1656-1664)	<ul style="list-style-type: none"> ➤ He was the youngest guru of all and was given the title of Guru at a very early age of 5, ➤ He was summoned by Aurangzeb against anti-islamic blasphemy.
Guru Teq Bahadur (1621-1675)	<ul style="list-style-type: none"> ➤ He found uced a new rite "Pahul"
Guru Gobind Singh (1666-1708)	<ul style="list-style-type: none"> ➤ He founded a warrior community known as Khalsa in 1699. ➤ He introduced a new rite "Pahul". ➤ He joined Bahadur Shah's as a noble. ➤ He was the last Sikh Guru in human form and he passed the Guruship of Sikhs to the Guru Granth Sahib.

Read more: [Guru Tegh Bahadur](#)

Viksit Bharat Young Leaders Dialogue

The Prime Minister of India announced the '**Viksit Bharat Young Leaders Dialogue**' (VBYLD) to be held in January in Delhi, coinciding with **Swami Vivekananda's 162nd birth anniversary**, and highlighted the **National Cadet Corps (NCC)** role in **youth development**.

Note:

- **VBYLD:** It aims to engage young minds from across India with no political background in politics, marking a significant initiative for youth empowerment.
 - The event will host 2,000 selected youth, with the PM engaging them alongside national and international experts to present innovative ideas for the nation's progress, helping to create a **roadmap for India's future**.
- **NCC:** The NCC was established in 1948 (on the recommendation of **H. N. Kunzru Committee-1946**), under the **NCC Act of 1948**, with the aim to develop character, comradeship, leadership, and service ideals in the youth.
 - It also seeks to stimulate interest in national defence and build a reserve for the Armed Forces in emergencies.
 - The NCC was preceded by the **University Corps (1917)**, later evolving into the **University Training Corps (UTC)** in 1920, and the **University Officers Training Corps (UOTC)** in 1942.
 - NCC is headed by a **Director General**, an Army Officer of the rank of **Lieutenant General**, who oversees its operations from the **NCC Headquarters in Delhi**.

Read more: [Changing Youth Concerns and Aspirations](#)

Bacteria to Solve Math Problems

The recent advancements in **synthetic biology**, particularly the **engineering of bacteria** to perform mathematical computations at the **Saha Institute of Nuclear Physics in Kolkata**, represent a significant breakthrough in the field.

- Researchers have engineered ***Escherichia coli bacteria*** to act as **biological computers capable of solving mathematical problems**, such as determining whether a number is **prime or whether a letter is a vowel**.
 - This was achieved by introducing **genetic circuits** that can be activated by chemical inducers, allowing these bacteria to behave like **artificial neural networks (ANNs)**.
 - The team developed **bactoneurons**, engineered bacteria that function like **neurons** in a neural network.

- These bactoneurons process **chemical inputs and produce fluorescent proteins** based on specific computations.
 - By converting **mathematical problems into binary code** represented by the presence or absence of chemical compounds, the bacteria could respond to queries with **fluorescent signals indicating "yes" or "no."**
- The **engineered bacteria were capable of** more than just simple tasks; they could also solve optimization problems, like calculating the number of pieces a **pie could be divided into with a given number of straight cuts**.
 - This capability suggests that bacterial computers can handle progressively more complex computational tasks, potentially leading to applications in various fields.

Read more: [Artificial Neural Network](#)

National Dolphin Research Centre


The **National Dolphin Research Centre (NDRC)** in Patna has faced inactivity months after its inauguration, underscoring significant challenges and initiatives in conserving the **Gangetic River Dolphin**.

- Despite its establishment, the center remains non-operational due to a lack of necessary equipment and skilled personnel.
- **NDRC** was inaugurated in 2024 and dedicated to researching and conserving the Gangetic River dolphin.
 - It is located strategically near the **Ganga River** and aims to facilitate studies on dolphin behaviour, habitat, and conservation threats.
- **Initiatives for Gangetic Dolphin Conservation:**
 - **Project Dolphin**
 - **Conservation Action Plan for the Gangetic Dolphin:** It was prepared by the **National Ganga River Basin Authority**, detailing specific actions for habitat protection, community involvement, and mitigation of human-dolphin conflicts.
 - The plan includes conducting surveys to assess dolphin populations and threats while promoting awareness among local communities.

Note:

○ Protection Status:

- **IUCN:** Endangered
- **Indian Wildlife (Protection) Act 1972:** Schedule I
- **Convention on International Trade in Endangered Species (CITES):** Appendix I
- **Convention on Migratory Species (CMS):** Appendix I.



GANGES RIVER DOLPHIN

(Platanista gangetica gangetica)

National aquatic animal of India

Facts

- ✦ Can only live in freshwater; prefer deep water
- ✦ Essentially blind; hunts by emitting ultrasonic sound
- ✦ Can't breathe in water; must surface every 30-120 seconds for air
- ✦ Also called 'susu' because of sound they make while breathing

Habitat & Distribution

- ✦ Distributed in Ganges and Brahmaputra River basins of India, Nepal and Bangladesh.
- ✦ Distribution range in India covers 7 states namely, Assam, Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, Jharkhand and West Bengal.

Protection Status

- ✦ **IUCN Red List:** Endangered
- ✦ **CITES:** Appendix I
- ✦ **Wildlife Protection Act 1972:** Schedule I

Threats

- ✦ Habitat destruction
- ✦ Pollution
- ✦ Bycatch
- ✦ Climate Change
- ✦ Hunting

Conservation Efforts

- ✦ **Project Dolphin (2021):** On lines of project Tiger
- ✦ **National Dolphin Research Centre (2021):** India's and Asia's First; in Patna University (Bihar)
- ✦ **Dedicated Dolphin Sanctuary:**
 - ▢ Vikramshila sanctuary (Bihar) – 1991
 - ▢ Hastinapur sanctuary (UP) – Proposed

Read more: [India's First Dolphin Research Centre](#)

Bandipur Tiger Reserve

Recently, the government has imposed restrictions on the annual jatara (last Monday of **Kartika month**) of **Beladakuppe Sri Mahadeshwaraswamy Temple** which is in the **core area** of **Bandipur Tiger Reserve (BTR)**.

- The temple is situated within the **Hediyala range of BTR**, a protected area for wildlife.
- Tiger reserves are constituted using a **core and buffer conservation method**.
 - **The core area is free of all human use** while the **buffer area** has **conservation oriented land use**.
- **About BTR (Karnataka):**
 - BTR is a key component of the **Western Ghats landscape**, which houses **1/8th** of the **world's tiger population**.

Note:

- It is part of the **Bandipur, Nagarahole, Wayanad, Mudumalai, and Sathyamangalam Tiger Landscape**, which spans across **Karnataka, Tamil Nadu, and Kerala**.
- It forms a crucial part of the **Nilgiri Biosphere Reserve**, the first Biosphere Reserve in India (1986).
- The reserve is part of the **Mysore Elephant Reserve**, home to the world's largest population of **Asian Elephants**.

Read More: [Project Tiger](#)

Bhu-Neer Portal

The Ministry of Jal Shakti during the **8th India Water Week-2024** launched the “**Bhu-Neer**” portal, a significant initiative aimed at enhancing **groundwater** regulation in India.

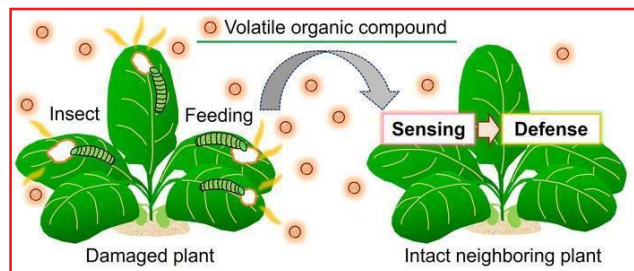
- **About:** The Bhu-Neer portal was developed by the **Central Ground Water Authority (CGWA)** under the Ministry of Jal Shakti in collaboration with the **National Informatics Centre (NIC)**.
 - It aims to improve groundwater regulation, ensuring transparency, efficiency, and sustainability in groundwater usage.
- **Key Features:** The Portal has a centralised database for groundwater compliance and policies, enhancing the **Ease of Doing Business** by simplifying groundwater regulation.
 - User-friendly interface with a **Permanent Account Number**-based single ID system.
 - **NOC (No Objection Certificate)** generation with QR code for streamlined processes.
- CGWA has been constituted under the **Environment (Protection) Act, 1986** to regulate and control the development and management of groundwater resources in the country.
- NIC, established in 1976, is a key builder of **e-Government applications and promoter of digital opportunities** for sustainable development under the **Ministry of Electronics and Information Technology (MeitY)**.

Read more: [Protecting Our Groundwater: A Priority for a Sustainable Future](#)

Science of Plant Communication

Plants though silent exhibit a **sophisticated communication system** crucial for their survival functioning through chemical signals and underground networks.

- **Chemical Warning System:** Plants release **volatile organic compounds (VOCs)** when threatened by **herbivores** or other dangers.
 - These **airborne and soil-borne signals** alert neighbouring plants to prepare **defensive mechanisms** like producing **toxins**.
 - VOCs can **travel through the air and soil**, allowing communication over considerable distances to protect plants.
- **Wood Wide Web:** Through **symbiotic relationships** with **mycorrhizal fungi**, plants form an **underground network** called “**wood wide web**.”
 - This fungal network facilitates **nutrient exchange and distress signals**, helping plants collectively **respond to droughts or pests**.
- **Cooperation and Support:** Plants share nutrients to aid struggling neighbours, especially in resource-scarce environments like **dense forests**.
 - This cooperative behaviour fosters ecosystem **resilience and enhances** overall forest health.



Read More: [Plant-to-Plant Warning Signals](#).

Rare White Peacock

Recently, a rare **leucistic peacock** with **white feathers** was rescued in Coimbatore.

- The peacock's **white feathers** are due to **leucism**, a genetic condition that **prevents melanin** and other

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pigments from being deposited on feathers at normal levels which has resulted in dark eyes, pink bill, and feet of peacock.

○ White Peacock is not a different species of peacock.

➤ **Leucism:** **Leucism** is a genetic condition that results in **partial loss of pigmentation** in animals, leading to **white, pale, or patchy coloration** while retaining normal eye colour.

○ It is different from **albinism**, which involves a **complete lack of melanin** and often results in red or pink eyes.

○ Melanin is a **natural pigment** that **colours skin, hair, and eyes**, and shields them from **Ultra Violet (UV)** damage.

➤ **Peacock:**

○ **Peafowl** is the collective term for peacocks, with the male called a **peacock** and the female a **peahen**.

○ The **Indian peacock** (*Pavo cristatus*) is the **National Bird of India**, belongs to the **Phasianidae family**.

• This family also includes pheasants, quails, partridges, and jungle fowl.

○ **Species of Peafowl:**

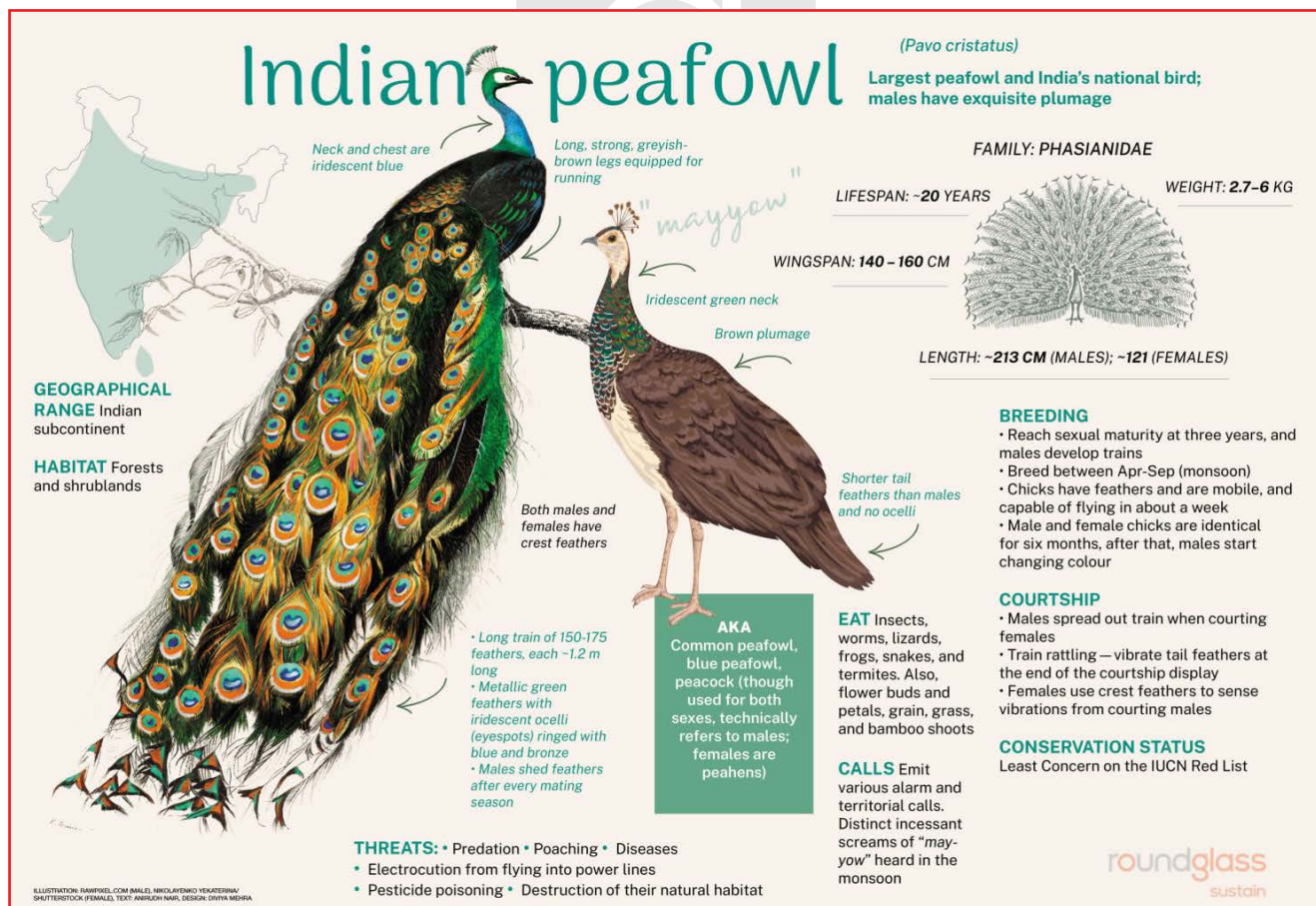
• **Indian (Blue) Peacock:** Native to **India and Sri Lanka**.

• **Green (Javanese) Peacock:** Found from **Myanmar to Java**.

○ **Protection Status:**

• **IUCN:** Listed as **Least Concern**.

• **Wildlife Protection Act, 1972:** Schedule I



Read more: [Indian Peafowl](#)

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Salt Chimneys in the Dead Sea

Recently, researchers discovered unique **salt chimneys** on the **Dead Sea** floor, formed by highly **saline groundwater**.

- **Salt chimney:** These are **vertical mineral structures formed by saline groundwater** rising through the **Dead Sea**, crystallising salt upon contact.
 - These chimneys are created by the upward flow of **hypersaline brine** from **aquifers**, which crystallizes upon contact with the Dead Sea's water.
 - **Hypersaline brine** is highly concentrated saltwater, denser than freshwater, formed from dissolved minerals in groundwater, often leading to crystallisation.
 - The chimneys grow rapidly and are significant as early indicators of **sinkhole** risks, providing clues to areas prone to **karstification** and **ground collapse**.
- **Dead Sea:** It is a **salt lake** located between **Israel** and **Jordan**, bordered by the **Judean Hills** to the west and the **Transjordanian Plateau** to the east, at 430 meters below sea level, making it the **lowest point** on Earth.
 - It is **one of the saltiest bodies of water**, with unique therapeutic properties. Its water level drops annually due to minimal inflow and high evaporation.
 - Historically, the **Jordan River** was its primary water source, but today, the Dead Sea is mainly fed by **sulfur springs** and wastewater.

Read More: [World's Longest Salt Cave](#)

WAVES OTT Platform of Prasar Bharati

Recently, **Prasar Bharati** launched its **OTT (Over-the-Top) platform WAVES**, to cater to India's increasing demand for digital streaming services.

- **WAVES:**
 - It offers a variety of content, including live TV, video on demand, radio streaming, games, and e-commerce via the **ONDC network**.
 - It provides access to 65 live channels, covering genres like infotainment, news, and culture.

- The platform is free to download, with **most content available at no cost**, while premium features are available through subscription plans.

➤ OTT and Its Regulation:

- **OTT** refers to streaming services delivering content via the internet, bypassing traditional broadcast methods.
- The OTT platforms are regulated by the **Ministry of Information and Broadcasting**, ensuring content compliance and accountability.
 - In 2022, the **Central Government** introduced the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021** to regulate OTT platforms.

Read More: [Over the Top Platform in India](#)

Guided Pinaka Weapon System

Recently, the **Defence Research and Development Organisation (DRDO)** successfully completed the Flight Tests of the **Guided Pinaka Weapon System** as part of **Provisional Staff Qualitative Requirements (PSQR) Validation Trials**.

- The PSQR parameters include **range, accuracy, consistency**, and the **ability to fire multiple rockets simultaneously in salvo mode**.
- **Guided Pinaka Missile System:** It is a multi-barrel rocket launcher system, designed by the **Armament Research and Development Establishment (ARDE)**, a laboratory of the DRDO.
 - Named after **Lord Shiva's bow**, Pinaka is a **versatile and high-precision rocket system**.
- **Key Features:** Renowned for its mobility, rapid response, and capability to deliver concentrated firepower on enemy targets.
 - The initial version of the weapon system was called **Mark I**, which had a **range of 40 km**.
 - The upgraded version or **Pinaka Mark II** has an extended range of **70 to 80 km**, with plans to reach **120 km** and **300 km** in the future.
 - Tested successfully from upgraded launchers, firing **12 rockets per salvo**.

Read more: [Pinaka Missile System - Drishti IAS](#)

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Indigenous Antibiotic Nafithromycin

Recently, India launched **Nafithromycin**, India's first indigenous antibiotic aimed at tackling **Antimicrobial Resistance (AMR)**.

- **Nafithromycin** was developed with support from the **Biotechnology Industry Research Assistance Council (BIRAC)** and brought to market by **Wockhardt** under the brand name **Miqnaf**.
 - Nafithromycin is the **first new antibiotic** in its class in over 30 years, marking a breakthrough in the fight against AMR.
- It is designed to treat **Community-Acquired Bacterial Pneumonia (CABP)**, caused by drug-resistant bacteria like *Streptococcus pneumoniae*.
- The launch coincides with **World AMR Awareness Week (18-24 November) 2024** with the theme 'Preventing Antimicrobial Resistance Together'.

Read More: [Antimicrobial Resistance](#)

Sacred Relics of Saint Francis Xavier

Recently, the decennial exposition of the sacred relics of **Saint Francis Xavier** began which will run until **5th January 2025**.

- The relics of Saint Francis Xavier, housed at the **Basilica of Bom Jesus** in Old Goa since **1624**, has shown **minimal signs of decay** despite being exhumed multiple times.
- He is referred to as **Goencho Saib** (Lord of Goa), who arrived in Goa in **1542**.
- He was a **Spanish Jesuit missionary** whose mission was to **restore Christianity** among the Portuguese settlers. He was one of the founders of the Jesuit order.
- He died in **1552** on **Shangchuan Island off China's coast**. He was first buried on the island.
 - His body was later moved to **Malacca** and finally to **Goa in 1554** and kept at **St Paul's College in Old Goa**, the first building constructed by Jesuits in Goa.
- The **Feast of St. Francis Xavier**, held on **3rd December** at the Basilica of Bom Jesus, is **Goa's biggest Christian**

festival, marking the anniversary of **St. Francis Xavier's death**.

Read More: [Portuguese President's Visit to India](#)

India's Tea Industry

The **Tea industry in India** has experienced a boost in profits during the September quarter, driven by **higher prices** despite a **decline in production** caused by **climate change**.

- A dry spell and erratic rainfall led to a production loss of **76.73 million kg (mkg) compared to 2023**.
- Policies of **Tea Board of India** including **early garden closures** and **quality compliance**, helped align stakeholder interests and improve market signals, while cost management and quality focus **boosted profitability for some companies**.
- India is one of the **top 5 tea exporters**, accounting for 10% of global exports. In 2023-24, it exported 250.73 million kg of tea, with Assam, Darjeeling, and Nilgiri teas renowned globally.
- **Tea Board of India**: It was established under the **Tea Act of 1953** as a **statutory body** of the Central Government under the **Ministry of Commerce**, has its **head office in Kolkata, West Bengal**, also has three overseas offices in **London, Dubai, and Moscow**.
- The **Indian Tea Association** established in **1881**, cautioning that rising wages and production costs may erase **fourth-quarter (October - December) profits** due to halted production.

Read more: [Tea Board of India](#)

India's 10-Year Coffee Growth Plan

The **Coffee Board of India** has launched a 10-year roadmap with the goal of doubling the **country's coffee** production and exports by 2034.

- **Highlights of 10-Year Coffee Growth Plan**: The Coffee Board plans to establish **100 Farmer Producer Organisations (FPOs)**, to support growers and enhance market presence.
 - The plan aims to identify **10,000 small farmers** to grow **specialty coffee for export**, enabling them to sell at premium prices.

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- It aims to establish **10,000 coffee kiosks**, mostly managed by women entrepreneurs, to **increase domestic coffee consumption** from 107 grams to 250 grams per capita.
- The goal is to nearly triple coffee production from **3.7 lakh tonnes in 2024-25 to 9 lakh tonnes by 2047**.
- **Coffee in India:** India produces two types of coffee, **Arabica and Robusta**, with Karnataka as the largest producer. In 2022-2023, it became the 8th largest coffee grower. By August 2024, coffee exports reached **USD 1.19 billion**.
- **Coffee Board of India:** It is a **statutory organization** constituted under the **Coffee Act, 1942**, and functions under the administrative control of the **Ministry of Commerce and Industry**. It is headquartered in **Bengaluru**.

Read more: [Possible Decline in Coffee Production](#)

Tropical Rainforests can Survive Global Warming

- A recent study by IIT Kharagpur reveals **tropical rainforests'** potential resilience to **global warming**.
- The study examined **fossilised tropical rainforests from Gujarat's Vastan coal mines**, dating back 56

million years to the Palaeocene-Eocene Thermal Maximum (PETM), an era of extreme global warming.

- The coal layers in Vastan are fossilised tropical rainforests with rich plant, pollen, mammal, and insect remains from the **PETM era** when India was a tropical island **with high CO₂ levels**.
- **PETM**, a short interval of maximum temperature lasting approximately 100,000 years during the late Paleocene and early **Eocene epochs (roughly 55 million years ago)**.
- Despite high atmospheric CO₂ **during the PETM**, **tropical rainforests not only survived but diversified**, likely sustained by **"rainfall-buffered temperature"**
 - **Rainfall-Buffered Temperature:** Increased rainfall during warming periods likely lowered temperatures, sustaining the rainforests.
- **Rainforest:** A **rainforest** is an area densely populated with tall, mostly evergreen trees (e.g. **Amazon** and **Western Ghats**) and receives substantial rainfall.
 - They are primarily situated between tropics (**Cancer** and **Capricorn**). These rainforests are found in Central and South America, western and central Africa, western India, Southeast Asia, the island of New Guinea, and Australia.



Readmore: [Exploring the Rich Ecosystems of Rainforests](#)

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Sanyukt Vimochan 2024

Recently, the Indian Army held the 'Sanyukt Vimochan 2024' **Humanitarian Assistance and Disaster Relief (HADR)** exercise in Ahmedabad and Porbandar, Gujarat.

- **Focus:** It focussed on the theme of 'Cyclone in Coastal Region of Gujarat'.
- **Objective:** To showcase India's readiness for **disaster response** and to strengthen **multilateral cooperation** in humanitarian assistance.
- **Participation:** Indian Army, Indian Navy, Indian Airforce, **Indian Coast Guard**, **National Disaster Response Force**, **State Disaster Response Force** and other Central & State Agencies.
 - It had representatives from **15 organisations** across **nine friendly foreign countries**.
- **Indigenous Capabilities:** The exercise featured the use of **indigenous HADR equipment** like **fire-resistant clothing**, aligning with the Indian government's initiative of **Atmanirbhar Bharat**.

Read More: [HADR Exercise Samanvay 2022](#)

Aphantasia

A study by the University of Glasgow explored **aphantasia**, a condition where individuals **cannot visualise images in their mind**.

- Aphantasia, first noted by Francis Galton in the 1880s; the term "aphantasia" was coined in 2015 by neurologist Adam Zeman.
 - It affects about **2% of the population**, with ongoing research needed to understand its causes and implications.
- On the other end of the spectrum are individuals with **hyperphantasia**, who possess an exceptionally vivid imagination, often experiencing mental images as if they were real.

Read more: [Cognitive Test](#)

India's Satellite Launch by SpaceX

Recently, India's **GSAT-N2 (GSAT-20) communication satellite** was successfully launched by **SpaceX's Falcon-9 rocket** from Cape Canaveral, Florida, US.

- Falcon-9 launched the GSAT-N2 into a **geosynchronous transfer orbit (GTO)**, an **elliptical orbit** with an altitude of **around 37,000 km**, which is the first step toward reaching a **geosynchronous or geostationary orbit (GSO)**.
 - The spacecraft **circularises the GTO orbit** by turning parallel to the **equator** at apoapsis and **firing its rocket engine** to reach **GSO**.
 - **Apoapsis** is the point in an orbit when an **object is farthest away** from the body it is orbiting.
- This is **India's first collaboration** with Elon Musk's SpaceX.
- The satellite belongs to **NewSpace India Limited (NSIL)**, which is the **commercial arm of ISRO**.
 - NSIL has been mandated to **build, launch, own and operate** satellites in **"demand-driven mode"** to meet service needs of the user.
- The GSAT-N2 is the **2nd demand-driven satellite** of NSIL. Its first demand-driven satellite was **GSAT-24** launched in **June 2022**.

Read More: [Completion of SSLV Development Project](#)

Bharat National Cyber Security Exercise 2024

Recently, the **Bharat National Cyber Security Exercise (Bharat NCX 2024)** was inaugurated to fortify **India's cybersecurity resilience**.

- It is a **12-day exercise** to prepare India's **cybersecurity professionals** to tackle evolving threats with advanced cyber defence capabilities.
- Key Features of the Exercise:
 - **Cyber Defense Training:** Offers training on defending against **cyberattacks** and incident response.
 - **Live-Fire Simulations:** Provides hands-on experience with cyberattacks on IT systems.
 - **Strategic Decision-Making:** Simulates decision-making during **national cyber crises** for senior management.
 - **CISO's Conclave:** Chief Information Security Officers (CISO) from various sectors discuss trends and government initiatives.
 - **Cybersecurity Startup Exhibition:** Showcases innovative cybersecurity solutions from Indian startups.

Read More: [Strengthening India's Cyber Defence](#)

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World Toilet Day

World Toilet Day, observed annually (since 2013) on **19th November**, is a **United Nations** initiative raising awareness about the **global sanitation crisis** and **promoting safe, accessible toilets** as part of **Sustainable Development Goal 6: Ensuring water and sanitation for all by 2030**.

- **2024 Theme: 'Toilets-A Place for Peace'** which emphasises that billions of people face heightened threats to sanitation due to **conflict, climate change, natural disasters, and systemic neglect**.
- **Global Sanitation Crisis:** 3.5 billion people lack safely managed sanitation, and 419 million still practise open defecation, contributing to health risks such as **cholera**.
 - The **World Health Organization (WHO)** in 2023 reported that unsafe water, sanitation, and hygiene

are responsible for approximately **1,000 deaths of children under the age of five every day**, and improved sanitation could potentially save **1.4 million lives annually**.

- **India's Efforts for Safe Sanitation:** India launched the **"Hamara Shauchalay: Hamara Samman"** campaign, linking sanitation with human rights, dignity, and privacy, particularly for women and girls.
 - **Swachh Bharat Mission (SBM) (Grameen):** 75% of villages in India achieved **Open Defecation Free(ODF) Plus(+)** status under **Phase II of the SBM Grameen**.
 - **SBM-Urban:** 63.63 lakh household latrines and 6.36 lakh community toilets were constructed under **SBM-Urban**.
 - 93% of women in ODF regions reported **enhanced feelings of security and dignity**.



Read more: [Making Swachh Bharat Mission A Reality](#)

Tuna Export Hub in Andaman & Nicobar Islands

Recently, the **Fisheries Department** plans to develop the **Andaman and Nicobar (A&N) Islands** as a tuna export hub.

- The global tuna market is worth USD 41.94 billion and the **Indian Ocean** is considered the **second-largest tuna region**, producing **21% of the world's tuna**.
 - As per **Marine Products Export Development Authority**, India's tuna exports surged by 31.83% in 2023-24, (valued at USD 87.96 million).
- The majority of the market is made up of four tuna species namely, **Skipjack, Yellowfin, Bigeye, and Albacore**.

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- Due to their **vascular system**, tunas can uniquely maintain their body temperature above the surrounding water, often between 5 to 12 °C (higher than the ambient temperature).

➤ **A&N Islands:**

- This comprises of two island groups (Andaman Islands and the Nicobar Islands) which **separates the Andaman Sea to the east from the Indian Ocean**.
- The **Ten Degree Channel** is a narrow strait that separates both the group of Islands.
 - **Indira Point (situated on Great Nicobar Island) is the southernmost tip of the Nicobar Islands.**
- The ANI is home to 5 **Particularly Vulnerable Tribal Groups**: Great Andamanese, Jarwas, Onges, Shompens and North Sentinelese.



Read more: [Andaman and Nicobar Islands to be Maritime and Startup Hub](#)

Grand Commander of the Order of the Niger (GCON) Award

Recently, Nigeria conferred its 2nd-highest national award, the **Grand Commander of the Order of the Niger (GCON)**, on India's Prime Minister.

- **India's Prime Minister** became the 2nd foreign dignitary to receive the distinction after **Queen Elizabeth**, who was conferred the award in 1969.

➤ **Key Facts about Nigeria:**

- It is often called the **"Giant of Africa"** and is the **most populous country in Africa**.
- It is the **largest economy** and the **richest oil resource center of the African continent**.
- It is located in **West Africa** and opens in the **Atlantic Ocean**.
- It is bordered by **Niger, Chad, Cameroon, and Benin**.



Read More: [High-grade lithium discovered in Nigeria](#)

Long Range Land Attack Cruise Missile

Recently, **Defence Research and Development Organisation (DRDO)** successfully conducted the maiden flight-test of the **Long Range Land Attack Cruise Missile (LRLACM)** off the coast of Odisha.

- **Precision Strike:** The missile has a precision strike range of **1,000 km**, ensuring accuracy and effectiveness in targeting strategic locations.
- **Advanced Technology:** It is equipped with **advanced avionics and software**, which enhance its reliability and operational efficiency.
 - It demonstrates the ability to navigate through **predetermined waypoints** while performing various **manoeuvres** and operating effectively at **different altitudes and speeds**.
- **Similarity:** Similar to the **US Tomahawk** and **Russia's Kalibr**, the LRLACM excels in delivering **precise, long-range strikes**.
- **Strategic Importance:** Such missiles are critical for **modern militaries**, enabling **stand-off attacks** on

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strategic targets while ensuring the safety of the launch platform and personnel.

- **Collaboration:** The LRLACM was developed by the Aeronautical Development Establishment, Bengaluru, with support from other DRDO laboratories and Indian industry partners.

Read more: [GSLV-F14/INSAT-3DS Mission](#).

Nepal-Bangladesh Power Transfer via India

Nepal started exporting electricity to Bangladesh using India's electricity grid, marking a significant milestone in regional energy cooperation.

- **Tri-nation Agreement:** The power transfer is a result of a tripartite power sales agreement between [National Thermal Power Corporation \(NTPC\)](#) Vidyut Vyapar Nigam, Nepal Electricity Authority (NEA), and Bangladesh Power Development Board (BPDB), signed in October 2023.
- **Electricity Crisis in Bangladesh:** Bangladesh is facing an electricity crisis, the export of 40 MW of Nepalese hydroelectric power to Bangladesh through the Indian grid aims to address Bangladesh's electricity shortage.
- **NVVN:** NTPC Vidyut Vyapar Nigam (NVVN) Ltd, a wholly owned subsidiary of NTPC Ltd, was formed in 2002 to tap into India's power trading potential. It holds the highest Category 'I' power trading licence as per [Central Electricity Regulatory Commission regulations](#).
 - NVVN is diversifying into [renewables, e-mobility, waste-to-green fuel](#) conversion, and providing comprehensive business solutions across the power value chain, in addition to trading in gypsum.
- **NTPC:** NTPC, a Central Public Sector Undertaking (PSU) under the Ministry of Power, established in 1975 to accelerate power development in the country.
 - NTPC became a [Maharatna company](#) in May 2010 and is headquartered in New Delhi.

Read more: [Power Markets in India](#)

Barak River

Three bodies found floating in Manipur's Barak River, in Jiribam district, are believed to be victims of the ongoing [violence in the state](#).

- **Barak River:** Originates from the Manipur hills in Senapati district. It flows along the Nagaland-Manipur border, enters Assam, and then Bangladesh, where it is known as the Surma and [Kushiyara](#), and later as the Meghna (before receiving the combined flow of the [Ganga](#) and the [Brahmaputra](#)).
 - The principal tributaries of Barak are the Jiri, the Dhaleswari, the Singla, the Longai, the Sonai and the Katakhal.
 - The Barak sub-basin drains areas in India, Bangladesh and Burma. It is bounded by the Barail range separating it from the [Brahmaputra basin on the north](#), by the Naga and Lushai hills on the east and by Mizo hills and territory of Bangladesh on the south and west.
 - The predominant soil types found in the sub-basin are [laterite and red and yellow soils](#).
 - The Barak sub-basin is divided into two major physiographic regions: the hilly areas (home to tribal populations) and the plains, which are densely populated and extensively cultivated.

Read more: [Violence in Manipur](#)

1st Bodoland Mohotsov

Recently, the [1st Bodoland Mohotsov](#) was organised on the 15th and 16th November in New Delhi.

- **Theme:** Peace and Harmony for Prosperous Bharat.
- **Objective:** Focus areas include the rich culture, language, education, and heritage of the Bodo community and other communities from the [Bodoland Territorial Region \(BTR\)](#).
- **Historical Significance:** It celebrated the recovery of the region post the [Bodo Peace Accord \(2020\)](#) which resolved decades of conflict and violence.
- **About Bodos:** Bodos are the largest community among Assam's notified [Scheduled Tribes](#), making up about 5-6% of the state's population.

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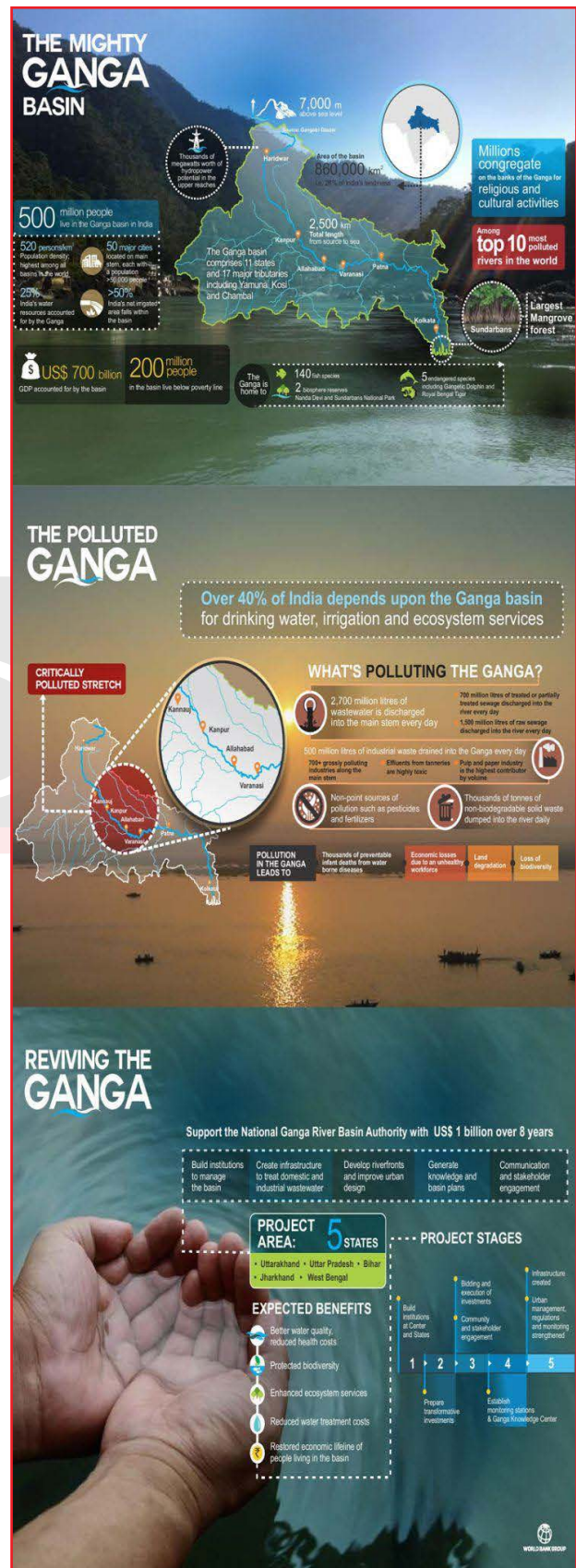
- In the **late 1980s**, the Bodos initiated a **mass movement** demanding a **separate state for the Bodos**.
- **About BTR:** Bodoland Territorial Region is an **autonomous region** in Assam consisting of four districts namely **Kokrajhar, Chirang, Baksa and Udalguri**.
- It is administered by an **elected body** known as the **Bodoland Territorial Council**.

Read More: [Bodoland Territorial Region \(BTR\)](#)

58th Meeting of National Mission for Clean Ganga

The **58th** Executive Committee meeting of the **National Mission for Clean Ganga (NMCG)** approved several pivotal projects aimed at **Ganga River conservation**, addressing environmental challenges.

- **Approved Projects:** Environmental Flow Assessment was approved to assess the environmental flow of **Chambal, Son, Damodar, and Tons** rivers for enhancing water quality and biodiversity.
- **Dolphin Rescue Initiative** was approved to develop a **Dolphin Ambulance** and raise awareness for **Ganga River dolphin conservation**.
- **Turtle Conservation** was approved to rehabilitate **endangered turtles** and reintroduce threatened species in the Ganga basin.
- **Kolkata Septage Treatment Plant (STP) Rehabilitation** was approved for the rehabilitation of the 50 millions of litres per day (MLD) STP at Keorapukur to improve water purification.
- **Rag-Rag Mein Ganga Series** was approved with a budget for the third season of the travelogue series to promote **Ganga's conservation** and cultural heritage.
- **NMCG:** It was registered as a society in 2011 under the **Societies Registration Act 1860**. It is the implementation wing of **National Ganga Council** (set in 2016; which replaced the **National Ganga River Basin Authority (NRGBA)**).
- The objective of the NMCG is to reduce pollution and **ensure rejuvenation of the Ganga river**.



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Job for Deceased Staffers' Kin

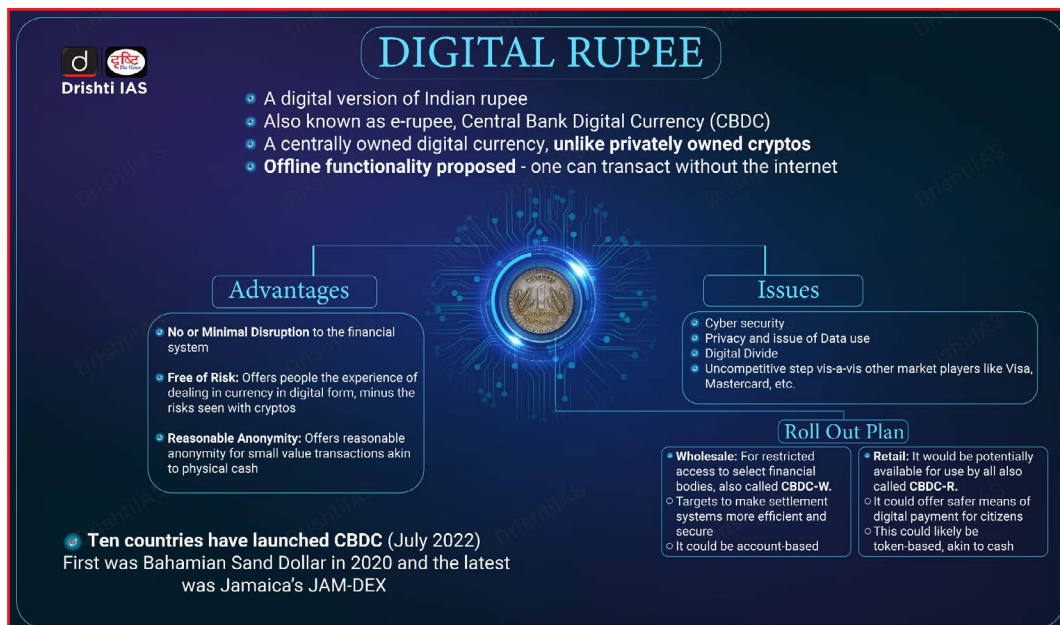
Recently, the **Supreme Court (SC)** ruled that **compassionate employment is not** a vested right but a **relief measure** for families after a government employee's death.

- The ruling addressed a case where **appointment claims** were made after significant **delays**, undermining the usual urgency for such applications.
 - SC highlighted that claims for **compassionate appointments** must be pursued **promptly**.
- Appointments are contingent on **statutory policies** and guidelines and not a service condition or entitlement.
- If **no policy or rule exists**, appointments on compassionate grounds **cannot be made**.
- Compassionate employment serves as an **exception** to the rule of **merit-based appointments**, reflecting the state's responsibility to assist affected families.

Europe's Digital Euro

The **European Central Bank (ECB)** has introduced the **digital euro** as a new **central bank digital currency (CBDC)**, designed to modernise the payment landscape in Europe.

- The digital euro aims to **facilitate direct payments without intermediary** banks or gateways, functioning as a digital version of cash that enables **peer-to-peer transactions, even offline**, while maintaining a level of **anonymity similar to cash**.
- Issued directly by the ECB, this CBDC is designed to **lower transaction costs**, including for **micro-payments** which are currently expensive with traditional banks.
- The ECB envisions the digital euro as a **counterbalance to non-European payment providers** and a tool to strengthen **Europe's digital sovereignty** against global competitors, especially US companies.
- The **Reserve Bank of India (RBI)** launched the **Digital Rupee (₹)** in 2022, as a CBDC.
 - CBDCs are a digital form of a **paper currency** and unlike **cryptocurrencies** that operate in a regulatory vacuum, these are legal tenders issued and backed by a central bank.



Read more: [Central Bank Digital Currency](#)

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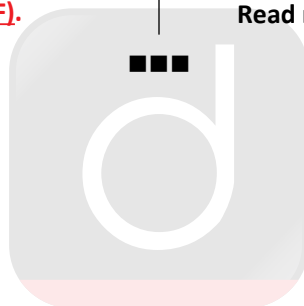
Wayanad Landslides and Disaster Status

The Union government has informed Kerala that the **Wayanad landslides** occurred in July 2024 cannot be declared as '**National Disaster**', citing **existing provisions and funds available for relief operations**.

- Wayanad landslides caused major damage to lives and property, prompting the Kerala government to request Rs 900 crore from the Centre for relief and rehabilitation efforts.
- **Centre's Response:** The Central Government clarified that there is **no provision to declare any calamity a "National Disaster"** under the existing guidelines of the **State Disaster Response Fund(SDRF)** and the **National Disaster Response Fund (NDRF)**.

- Centre stated that **disaster management** is primarily **the state's responsibility**, with the Centre offering logistical and financial support.
- Financial relief for affected individuals comes from the **SDRF** for **12 notified** natural disasters, including **floods** and **landslides**.
- In severe disasters, additional funds can be allocated from the NDRF after an assessment by an **Inter-Ministerial Central Team (IMCT)**.
- **Disaster:** As per the **Disaster Management(DM) Act 2005**, a disaster is defined as "a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made cause, or by accident."
- **Section 46(I) and Section 48(I)(a) of the DM Act, 2005** mandate the creation of a NDRF at the national level and a SDRF at the state level.

Read more: [Landslides in Wayanad](#)



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